



VOL. 44, No. 10

OCTOBER 1976

CONTENTS

TECHNICAL

Commercial Kinks	17
Fixed Wire Beams — Cheap but Effective	12
Living with Logic	11
Method of Reducing HV Power Line Noise	9
Newcomers Notebook	16
QRP Operation and the Argonaut 509	8
Quad for Twenty and Forty Metres	7

GENERAL

A.O.C.P. Exam Papers August 1976	20
A Rare Event	5

DEPARTMENTS

Awards Column	21
Book Review	20, 21
Contests	21
Hamads	25
IARU News	19
Intruder Watch	21
Ionospheric Predictions	25
LARA	23
Letters to the Editor	22
QSP	3, 22, 23, 25
Project Australis	23
Silent Keys	26
VHF-UHF an Expanding World	17
WIANEWS	4
20 Years Ago	21

COVER PHOTO

Cubs of the Winston "A" Pack take their turn at the radio at Mount Isa, Queensland, during Jamboree-on-the-air (JOTA), October, 1975. The operator in charge of the set is Owen Arnfeldt (VK4OV).

HAM

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S-meter, squelch, ant. & PA facility.

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27.125	27.225	27.255
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147.00 MHz

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QSP 19th JAMBOREE ON THE AIR

During the weekend of 16th/17th October 1976, the 19th International Scout Jamboree on the Air will again be enjoyed by over 200,000 Scouts and Guides throughout the Scouting Nations of the World, and hopefully by an equally impressive number of Australian amateur operators, which is believed to be well in excess of 5,000. Australia will contribute as its share, over 500 amateur radio operators and over 15,000 Scouts and Guides.

Jamboree on the Air was the brainchild of an English Scouter and amateur radio operator, Les Mitchell, who, incidentally, saw service in Australia as a member of the English Armed Forces during the Second World War. The idea came to Les during the Scouting World Jamboree at Sutton Coldfield in England in 1957, when over a modest cup of coffee one morning he suggested that he, and fellow Scouter/Amateurs at the Jamboree should meet together each year over the air, at that same time, to recall their happy acquaintance during that Jamboree.

However, the idea developed to include the Scouts in the respective groups, and of many other Scouts who were not fortunate enough to enjoy the excitement of personally attending a World Jamboree, but who could however, enjoy the spirit and excitement of such an International Scout gathering by means of Amateur Radio. So the theme of the first Jamboree on the Air was developed.

It is history now how the idea caught on like wildfire. The first Jamboree on the Air exceeded all expectations, and Les realised it would have to be taken over by the World Scouting Bureau, and so another amateur operator, Len Jarrett in the World Bureau, has since co-ordinated the activities of national organisers in all Scouting countries to build the activity up to the degree under which it operates today, thanks to the generosity of friendly amateurs throughout the world. Since that first Jamboree, it is estimated that over 2½ million Scouts and Guides have taken part in Jamboree on the Air.

Some remarkable "spin-offs" have resulted from these contacts. Scouts have exchanged visits with other Scouts throughout their own countries and even overseas as a result of initial contacts with each other during JOTA. Scouts and Scouters have developed an interest in amateur radio, through their association with this fine leisure activity and became amateur operators themselves. The writer is now one also.

Scouting has gained too by attracting many amateurs to Scouting as Warranted Scouters and non-uniformed supporters of Scouting at group and committee level. No doubt, this fine interchange will go on to the benefit of both organisations. The remarkable feature of JOTA has been the extension throughout the world of the best of the ideas of both organisations.

So hopefully, Jamboree on the Air will continue to prosper and if the idea has sufficiently caught your imagination to help you realise that you too can contribute greatly to the extension of that spirit, then please don't hesitate to offer your services.

If you do not know a Troop, and you can help, then write to the branch organiser, Jamboree on the Air, at the Branch Headquarters of the Scout Association of Australia in your capital city. I am sure you will be made most welcome.

Alternatively, a line to me at my QTH in the Call Book will ensure that your offer is directed to the right quarter. I can assure you that your good deed will be amply repaid by the satisfaction you will have given to Scouts or Guides who take part in what may well be their only International Scouting activity.

NOEL I. LYNCH VK4ZNI, National Organiser, 19th JOTA

QSP

TRAINING AND EXAM CONCEPT

"FCC approved ARRL's training concept in mid May, to be tried as an experimental one-year program. The League has proposed a carefully monitored training course of 10 to 12 lessons to be conducted by qualified, certified instructors. Upon satisfactory completion of the course, the student would be certified 'qualified for Novice licence' to the FCC, which would then issue him a licence without further exam. By the time you read this, approximately 40 clubs and organisations will be teaching courses under this program on a trial basis." Ham Radio July 76.

REVIEWS

Many readers would be pleased to learn that "Amateur Radio" is now included in the "Review of Reviews" column in the prestigious ITU Telecommunication Journal. In the June issue 74 different publications in 11 different languages were reviewed.

2 METRES "ON THE AIR"

Dick Smith, of Dick Smith Electronics will be flying his Piper Twin engine Comanche Aircraft — REG VH-DIC, in the Australian Air Race from Perth to Adelaide, Melbourne and Sydney from October 20th to 24th.

He will be operating continuously on all 2 Metre Amateur Channels using an FDK Multi 7 feeding a 1k wave whip (call sign VK3ZJP).

He will make an award for the contact with the longest communication distance (we hear one Amateur is setting up on Ayers Rock!).

Co-Pilot for the race will be famous Australian Aviatix, Nancy Bird-Walton.

Route segments are as follows — if you are planning to travel to a remote mountain top write to Dick first and he will listen especially for you. Oct. 20th — Start Perth — Norseman — Forest.

21st — Forest — Ceduna — Port Augusta — Adelaide.

22nd — Adelaide — Cameral — Warrnambool — Melbourne.

24th — Melbourne — Narrandera — Parks — Bathurst — Sydney.

WIANEWS

In WIANEWS August AR, brief mention was made about correspondence sent by the Executive to the Radio Frequency Management Division.

One of the more important submissions related to a consolidated list of outstandings, and additional material concerning our amateur service.

No less than 47 different items were included in the list under several broad headings. In the covering letter, concern was expressed that the administration of the amateur service appears to follow too closely on practices adopted for commercial services, and conversely that any de-restrictions which could be applied in favour of the amateur service could not in fact be carried through fear of creating precedents for the commercial services.

The hope was expressed that with a modest amount of initial effort, a considerable improvement could be achieved which could result in savings on both manpower and finances without significantly affecting standards. The WIA was concerned that the amateur service is being administered today in terms of procedures recognised in many other large countries as outmoded and unnecessarily restrictive. It is recognised that the officers of the Department are doing everything they can to keep the present system operational. The Institutes' case however, is that a review of the systems in use should be undertaken otherwise longer and longer delays and increasing frustration will create further and further problems.

Revisory work, it is believed, should be begun soon, before the administration has to devote more and more of its time to WARC 79 affairs.

Mention was made about the growing strength of the CB movement and the baleful influence of pirate activities mushrooming out of the ready availability of equipment. It had been hoped that Novice Licensing would have countered some of these pirate activities but delays and other problems in fact operated in reverse.

These are some of the broad principles which were further elaborated in discussions with "Central Office" late in August.

EXAMINATIONS

As might be expected this current problem merited the full treatment. Detailed syllabuses (especially Novice Theory) are considered essential. WIA assistance ought to be sought for the invigilation of some examinations by responsible licensed amateurs, and some of the elementary examinations and Morse code tests should actually be conducted by responsible amateurs under controlled conditions. "Multi-choice" papers should be expedited for all exams. Four AOCPE exams per year instead of two. Exams should be held in more places than at present.

The results of exams should be announced within 3, or at the most 4, weeks and that lists of successful candidates ought to be supplied together with a general appraisal of the examinations — what reasons caused the most failures and so on.

Definite lists of exemptions and alternative qualifications were desired and "conceded passes" should be examined. In the Morse exams, it is felt that stickers or endorsements should be available for passing at different speeds and that the method of sending the novice Morse should be reviewed.

Incidentally this latter request received sympathetic consideration and it was agreed at the interview that an Executive Group would hold discussions with the P. & T. Examinations section.

Other submissions covered repeater conditions and the need for sensible liberalisation having regard to sensitive frequency spots on shared bands. A later submission was made to obtain approval in principle for cross-band attended and unattended ATV repeaters affecting the 70 cm, 23 cm and 576 MHz bands.

Identification should be extended to 10 minutes instead of the present 5 minutes was another request. Reviews should be

made on paragraphs 80(a) and 94 of the Handbook, beacons should be licensed in any part of any amateur band subject to compliance with an agreed band plan.

Interference problems were enumerated including radio alarms and other devices operating in amateur bands, the old problems of TV channels O and 5A and the need to improve standards designed to reduce RFI susceptibility of consumer electronic products.

Some provision should be made for limited licensees to qualify and use CW, RTTY restrictions should be revised to permit other codes including ASCII and official Divisional broadcasts should be subject to some liberalisation.

Additional frequencies were listed, including 26.1 to 26.3 MHz for Novices, re-allocation of 50 to 52 MHz and various others which will obviously form part of the WARC 79 brief.

And finally an array of general matters including call book inaccuracies, review of the amateur advisory committee service, reduced licence fees for pensioners and the disabled, vigorous apprehension of illegal operators, etc.

Altogether a formidable list.

CITIZENS BAND

At their August meeting the Executive continued their review of the "CB" situation. The existing WIA policy is still as published in AR for October 1974 page 8, and embraces opposition to law-breakers and any radio communication service for or on behalf of unqualified persons under uncontrolled conditions.

YRCS

During August, a Postal Vote was circulated to Divisions — "That having regard to practical considerations and the necessity for the re-organisation of WIA educational arrangements it is resolved that Motion 72.201 be rescinded and that no other similar constitutions be recognised, but that the Institute agrees to render every possible help and assistance for the training of youth as heretofore with the object of preparing them for the amateur examinations, including the continuing provision of certificate forms, publications and the like".

If this postal motion (No. 1/1976) is passed, it will mean that Federal YRCS will no longer exist and Divisions would be responsible for this activity within their respective States. This was a motion laid on the table for 3 months as discussed in depth at the 1976 Federal Convention.

FINANCES

An Examination of Executive costs incurred so far this year so as to review the 1977 budget was another area discussed in detail. The conclusion was reached that there should not be any increase in Federal dues for the year 1977.

ARNOLD REPORT

At their August meeting the Executive members also reviewed developments relating to the Investigators' Report by Bob Arnold. Some difficulty arises because of the apparent lack of feed-back from members and therefore an appraisal of the present situation was completed for the benefit of Federal Councilors, since it seems apparent that further work on this Report may now rest with the Divisions themselves.

PUBLIC RELATIONS

It was most heartening to the Executive that advice and assistance now seems to be at hand for public relations activities. Mr. Doug Anderson, VK3ZW, kindly attended the August meeting and spoke in depth about the media and allied subjects. Doug is the Director of the Victoria Promotions Committee and is therefore well placed and well qualified to help in the public relations field, in particular, when he has had time to absorb and evaluate current developments.

RECRUITING

At the time of writing, some 200 enquiries have come forward and every day sees more being processed. It is still too early to evaluate the drive but already new members are coming into the system on a firm basis and an expansion can therefore be predicted. The target figure is 8000 and hopefully existing members will wield their influence towards achieving this target. ■

A RARE EVENT

On Saturday October 23rd 1976 at 4.40 p.m. EAST a rare event will take place. Melbourne will experience a total Solar eclipse. Observers from all over the world will gather at vantage points in South Australia, Victoria and New South Wales to study and record the eclipse and its effects. Radio Amateurs will have an opportunity to add to the relatively scarce information on the effects of total eclipses.

Melbourne is one of only 20 cities with a population exceeding 2 million that will experience a total eclipse during the years 1900 to 2050. Sydney will experience a total eclipse in 2028.

According to past records, the sky over Melbourne at 3 p.m. on 23rd October is by average more than half covered by cloud. On only three occasions since 1957 has the Melbourne sky been cloudless at that time and date. (Sydneyers should check their own meteorological records before sniggering too loudly). There is in fact only one chance in three that the total eclipse will not be obscured by cloud. A number of aircraft ranging up to a Boeing 707 have been chartered to enable selected observers to rise above such possible restrictions. As shown on the map the total eclipse may be seen along a strip passing over Mt. Gambier, Bafarat, Melbourne and Merimbula.

Key times are listed in the table.

The short period of totality arises from the Moon's apparent diameter being only 5 per cent greater than the Sun's. This also accounts for the rarity of total eclipses and the limited number of vantage points from which they can be viewed.

On this occasion a partial eclipse will be visible in South East Africa, the

Location	Eclipse starts	Totality starts	Totality ends	Eclipse ends
Mt. Gambier	5h28m29s	6h36m11s	6h39m19s	7h40m26s
Melbourne	5h33m40s	6h39m26s	6h42m11s	7h41m39s
Merimbula	5h39m27s	6h42m51s	6h45m39s	7h43m03s

Table of Key Times. Times in UTC.

southern tip of India, Indonesia, parts of New Guinea and all of Australia and New Zealand.

WHAT TO LOOK FOR:

Before reading further, please read the warning.

In the area of the total eclipse day will briefly turn to night. Bright stars such as those in the Southern Cross and the Pointers will be clearly visible. Venus and Mars will be visible above the obscured sun's disc and Mercury a little below. Animals, insects, plants and perhaps people are expected to become confused. The air temperature will drop. Perhaps this will cause a temperature inversion or ducting may develop enabling VHF contacts to be made over extended distances along the path of totality. Two metre stations in Melbourne and Mt. Gambier should be able to test this out. The ionisation in the D and F layers will drop, perhaps producing evening time DX on the broadcast, 160, 80 and 40 metre bands for stations in the eclipse area. Amateurs have a rare chance to provide valuable scientific data.

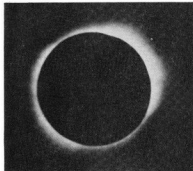
A SAFE VIEWING METHOD

There is **NO** safe way to look at the Sun directly.

A modified pinhole camera may be used for safe INDIRECT viewing. One can be easily constructed as follows.

Take two large stout pieces of card about 300 mm (1 ft.) square. Make a small round hole about 3 mm (1/8") in diameter in the centre of one card. Walk outside with the two cards and face North.

Hold the pierced card in the left hand (assuming afternoon viewing) and the other card in the right hand. Move the cards



Total solar eclipse, 20 June, 1974, Cape Leeuwin, W.A. T. B. Tregaskis.

until the centre of the shadow of the pierced card falls on the other card. A spot of light will be seen. This is a projected image of the sun. Focus the image by adjusting the card's spacing. A white card will give the brightest image. The eclipse will be clearly visible with this simple instrument.

Readers seeking more information particularly those requiring safe photography techniques should write for an information booklet which is available from —

The Secretary,
Astronomical Society of Victoria,
Box 1059J GPO,
Melbourne,
Vic. 3001.

Price is \$1.00 plus 54c postage.

Much of the information reproduced in this article was obtained from this booklet.

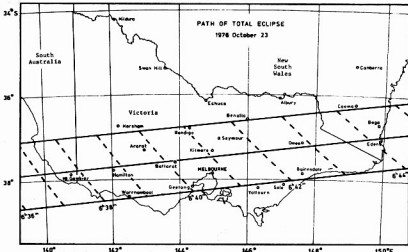
WARNING

It cannot be over-stressed that observing the Sun can permanently damage the eyes. During the partial phases of an eclipse, even though the area of the Sun which is not blacked-out by the Moon is relatively smaller than the full Solar disc, the light intensity is as high, and the risk of eye damage is just the same.

Do not under any circumstances look at the Sun through the camera view-finder, a telescope or its finder, binoculars or through any optical aid; the solar filters supplied with some telescopes are also not suitable.

Even with the unaided eye, the Sun is too intense to be observed directly without eye damage for more than a fleeting glimpse, this holds true during all partial phases of the eclipse.

Crossed polarizing filters are NOT a safe observing aid at any period during the eclipse.



**ICOM****.....WHERE QUALITY COUNTS !****IC225 PLL SYNTHESISED****FM TRANSCEIVER*****\$220**

- Frequency selection via a programmable matrix. Any frequency multiple of 25 KHz between 146-148 MHz can be selected -- either simplex or duplex (including reverse). These are connected to any one of 23 channels on the front panel.
- New ceramic discriminator
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- Instantaneous Deviation Control
- Electronic Tx/Rx relay
- Full SWR protection
- 90 days VICOM warranty

NEW**Specifications**

Semiconductors: 34 transistors, 7 FET, 13 IC, up to 128 diodes.
 Voltage: 13.8vdc negative ground. Current drain 2 amps at 10 watts tx, 700 mA at max audio.
 Power Out: 10 watts or 1 watt switchable
 Rx IF: Double Superhet, 10.7 MHz/455 KHz
 Sensitivity: Better than 0.4 μ V 20 dB
 Tx Spurious: Better than -60 dB below carrier

Comes complete with microphone, mobile mounting bracket, English manual, plugs and cables.

This is ICOM's first FM portable, and it puts good times on the go. Change vehicles, walk through the park, climb a hill, the ICOM quality FM communications go right along with you. Long lasting internal batteries make portable FM really portable, while accessible features make conversion to external power fast and easy!

- Fully collapsible antenna
- 15 channels (12 on dial and 3 priority)
- Dual power - 3 watts high/400 mW low, nominal
- Lighted dial and meter
- 36 transistor, 3 FET, 2 IC, 51 diodes
- Super sensitive receiver
- Crystal specifications identical to IC22a

Your new IC-215 comes supplied with: 3 popular channels, handheld mic with protective case, shoulder strap, connectors for external power and speaker, 9 long-life C batteries, English manual and 90 day warranty

IC215**FM PORTABLE****\$164****IC202 3w SSB**

The famous IC-202 handy portable runs 3 watts pep, 3 watts cw, with VXO control 144-146 MHz. The rig comes wired with 2 crystals for coverage 144.0-144.4 MHz, each crystal giving 200 KHz continuous coverage. Extra crystals (OSKER etc) available for the remaining two crystal positions. The rig features noise blanker, RIT control, lighted dial and meter, super sensitive receiver, telescopic whip antenna and of course that ICOM quality! Your new IC-202 comes complete with mic, carrystrap, dry cells, English Manual and 90 day warranty.

6 metres

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A QUAD FOR 20 AND 40 METRES

(COPYRIGHT)

David S. Down VK5HP

17 Brodie Cres., Christies Beach, S.A. 5165

This antenna is primarily designed for the low power operator, who uses every antenna advantage he can get, and not for the lid who substitutes over-the-limit power for poor operating ability.

For QRP DX operation, the better the operator and his antenna, the better the DX results. I will not attempt an article to improve the operator, but I can suggest trying this antenna.

The basic considerations for this design, were that the antenna had to be effective, simple, cheap and as compact as possible without using traps. Traps, of course are ineffective radiating portions of radiating elements — bad news for QRP operations.

To make the quad universally appealing, certain standards were set, which, at MINIMUM, I felt, covered the average QRP op's domestic requirements, but which allowed for individual variations for further improved performance:

1. Low mounting height of 30 feet, unguyed.
2. Small turning circle.
3. Weight restricted to 25 lbs. to suit smaller rotators.
4. Cheap.
5. Materials available at least in each capital city.
6. Minimum equipment for construction and tuning.
7. Effective in performance.

"A quad on 40?", "Too unsightly", "Never turn it with your Stolle", "Have to jack it up 100 feet so it looks in proportion", were some of the comments I had on making initial enquiries about such an antenna. Everyone condemned size and weight, but not efficiency, so I thought that if I could reduce the size and weight but retain efficiency, then I would have achieved something worthwhile.

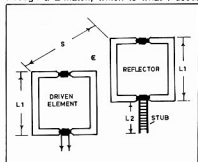
Figuring that by using 300 ohm TV ribbon, I could effectively halve the element size, the spacing then became the critical size factor, so a compromise was made regarding efficiency versus size, and some spacing was sacrificed.

The prototype was built and roped to the tower; using my standard 3 watt output CW rig and a beam heading of roughly NE, I worked VK2/3/4, JA, JD1, HM and HL, 9V0, FK8, W & K, KH6 and VE lands. Being easily pleased, and quite satisfied with that result on 40 metres, I returned to 20m CW, 3 watts output and same beam heading, logging I, DL, F, HA, HB, UA and UK for my trouble. I didn't get any 599s from the DX QSOs, but reports varied from 339 to 579. That is an advantage of CW — if you can hear them, you can work them.

Some of the stations worked on 40 at the time, were inaudible on either my G5RV or double extended Zepp via the main station receiver also used for the QRP tests. I manhandled the quad around about 180 degrees, and one CW CQ call resulted in a ZS6 and a FB8.

The next stage was to dispense with a boom, reducing weight and wind resistance. A spider quad evolved, using Rangoon cane spreaders, TV ribbon elements and feeder.

A closed loop of TV ribbon has a feed-point impedance of about 600 ohms. By placing a second similar loop as a reflector, this figure drops to 300 ohms — very convenient for 300 ohm feeder through a Z-match, which is what I used.



X-Q ANTENNA — STUB TUNED
300 ohm TV ribbon elements and feeder.
GAIN: 9.5 dB over dipole.

F/B: 22 dB approx.

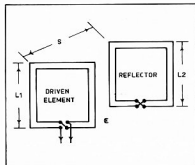
Insulators (top and bottom) are strips of tag-board.

Band	L1	L2	S
40	33'3"	18'9"	17'
20	16'8½"	9'4½"	8'6"
15	11'1½"	6'3"	5'8"
11	8'8½"	4'10½"	4'6"
10	8'3"	4'7½"	4'3"

The spider "boom", mounting pipe to rotator and hardware, was given 8 coats of marine paint, whilst the spreaders had 2 coats of marine sealer followed by 6 coats of marine paint. As for the 300 ohm ribbon, it received a liberal dose of melted black shoe-polish to improve its weather-handling ability.

All up weight is less than 25 pounds, and the total cost of all materials including the paints, less than \$50. Elements for 15, 11, and 10 metres may be added if desired. The type of boom is also optional as is the type of reflector (either continuous tuned loop, or stub tuned loop). The antenna may also be fed with coax and balun.

Further variations have since been used at this QTH, both of which are known as X-Q (expanded quad) Antennas. These are



STUBLESS 40-20 m QUAD
300 ohm TV ribbon elements and feeder.
GAIN 7.3 dB over dipole.

F/B: 25 dB approx.

Band	L1	L2	S
40	17'7"	18'2"	17'
20	8'10"	9'1"	8'5"
15	5'10"	6'1½"	5'7"
11	4'4¾"	4'9"	4'4"
10	4'4"	4'6½"	4'2"

similar in appearance, except the sides of the loop are half or full wave (depending on space available), and the upper horizontal section of each element is divided in half at the point of minimum current.

A single loop X-Q antenna gives 5 dB gain, and the 2 element version gives 9.5 dB gain, both over a dipole, with a front-to-back ratio in the order of 22 dB. This is comparable to the standard quad (except the X-Q gain is greater), but the X-Q has a sharper forward radiating lobe.

The so-called "difficulty" in handling quads was easily overcome, by use of a 14 foot piece of 2½ inch waterpipe roped to a suitable support in the yard.

The assembly of one side of the quad is done on the ground, following which the mounting pipe for the rotator is mounted to the spider, and both are inserted in the vertical piece of waterpipe. The second element is then assembled on the ground, then taken via a ladder, up to the spider and bolted to it. Tuning can then be done whilst the antenna is still atop the water pipe.

When assembly and tuning was completed, the pipe and quad were walked to the tower base, a shoulder (courtesy Arnie VK5VS) put beneath the spider boom, and a monkey up the pole trick completed the procedure. The mast insert is then fitted to the rotator, and the necessary clamping arrangements finalised. Since Arnie's first trip up the tower, the quad has been back to ground 4 times for modifications to an X-Q array, and the total rigging-derigging time is down to 90 seconds. Very handy not having a guyed tower!

On air, the sceptics raise a smile from me — not too many believe that 3 watts is behind the signal heard, but then it is natural to be apprehensive of something one has not seen for himself, especially when the QRP station is receiving DX RST reports equal to, or an S-point lower than, the full power station. The rig is inconsequential. The antenna and its feed system is not. Only when you go QRP per-

manently, and sacrifice everything that the "knowledgeable"(?) amateurs seem to need like life's blood itself (over the limit power and commercial antennas), do you realise the efficiency of an antenna system pruned to a millimetre, the feeder pruned to a small fraction of a wavelength, properly soldered and sealed connections and connectors, the insertion loss of meters and filters, the use of propagation charts, operating skill and patience. And

when you drag the DX in, you know you built it all, and you are OPERATING!

QRP (3 watts) WAC, WAS and 64 countries to date, will keep me on QRP for a while, and probably still experimenting with antennas and their feeders.

If you want to test yourself as an operator, and your present antenna for efficiency, see you on 40 and 20 metres QRP soon? ■

QRP OPERATION AND THE ARGONAUT 509

Les Smith VK2BCU

8 Dora Creek Rd., Coorabong, N.S.W., 2265

Some months ago I became interested in buying an Argonaut by the American Ten Tec company, but apart from a copy of the specs, a photograph in an advert and a few non committal answers by the agent on the phone, I was unable to find out anything about this low power 5 band transceiver. So if you are interested in the 509 or QRP operation (calling all novices) then this article is for you.

The unit was ordered from an agent in Springwood as the result of an advert in Amateur Radio. The unit arrived in due course, still obviously in the same packing material that it was shipped from the States in. On opening, the 509 gave the first impression of a neat unit with a pleasing appearance. Its HWD dimensions are 4 by 13 by 7 inches approximately. Front panel controls are as shown in Table 1. The most important controls of any transceiver, the tuning mechanism and dial movement have been well thought out. Tuning rate, an easy 15 kHz per revolution is obtained from a planetary drive, with no evidence of backlash. The main dial, a pointer and string arrangement is divided into 5 sections of 100 kHz each on the 4 lower bands. The skirt of the tuning knob is marked off in 1 kHz divisions, each 5 being numbered. One rotation of this skirt represents 100 kHz. The frequency is then calculated by adding the main pointer to the reading on the knob skirt. Many transceivers use this arrangement. For example in the 80 metre band, if the skirt reading is 47 and the main pointer is between 1 and 2 then the frequency is 3647 kHz or thereabouts.

The resonate control peaks the receiver RF section in the desired portion of the band. On 80 metres about 50 kHz can be covered without having to readjust this control; there is greater coverage on higher bands. The 10 metre band is covered in one switch position, with each revolution of the main tuning knob skirt representing 500 kHz. Dial accuracy is quoted at ± 5 kHz. This is substantially correct; see Table 2.

Stability, checked over a 15 minute

period, after 1 minute warm up turned out to be less than 10 Hz. In operation no drift is apparent. In fact if the set is picked up and moved about SSB signals stay readable.

Power requirements are 120 mA at 12 volts for receive (dial light off, volume at minimum setting) and 800 mA at rated CW output. Selectivity is satisfactory at 2.5 kHz bandwidth (shape factor 1.7 at 6/50 dB) and the sensitivity seems such that it would be capable of working anything within reason, even with a linear added. I have not had the opportunity of actually comparing it with another receiver. Since writing this I have been told that RX can outclass some of the more common transceivers on the market.

I found some facets of the set disappointing. These were the feel of the bandswitch, an off-centre hole in the main tuning knob, and the need to juggle the bandswitch on some bands to get the transmitter sections to work. The set proved to be microphonic when unpacked. As good as his word, the agent offered to have it repaired, but not wishing to send the set away, and after an excuse to look inside myself I became owner-serviceman. The trouble was a poor solder connection.

Internally the set is compact in construction, and cunning in design. The local oscillator uses a permeability tuning system, with a concept that could prove popular with homebrewers. Rather than heterodyne a fixed 5-5.5 MHz local oscillator to another frequency on bands like 40 or 15 metres before final mixing, the oscillator is multiplied to give the correct frequency relationships. On 15 metres for example, the oscillator is run on 6 MHz, doubled to

12 MHz, and subtracted from the received signal to give the required 9 MHz IF. The oscillator is run on approximately the same frequency give or take a megahertz or so, to give linear frequency readout. Despite this there are no obvious birdies.

A comprehensive service manual is included with the set.

The S meter is calibrated for signal strength S4-S9. For use without a linear amplifier this is normally adequate because most stations worked use at least 2½ S points more power than the 509 so that if they receive a signal at say S2, then they will get a report of S4-S5. The S meter also acts as the meter for the SWR bridge, the function desired being chosen by a front panel switch. Less than a mile from my QTH another station operates with a power of 250 watts. Despite this no cross modulation has ever been observed.

The broad band final amplifier seems to handle all sorts of mismatches without destruction, from dead shorts to open circuits or mistuned antennas. CW input is 5 watts.

Well so much for theory. How does low power operation in Australia go? I think that Ten Tec have summarised the case very well in the operators manual. "QRP is not push button communication. Because it does take skill and technique, it is an exciting and challenging facet of Amateur Radio". Low power operation is a good thing to start off in amateur radio with. It teaches many things. Because radiated power is low, good technique is essential. Without it, no contacts. So it teaches technique. An efficient antenna is a must. Therefore low power operation helps to

teach antenna fundamentals. And to understand propagation factors. These are all vital pieces of information to the new amateur.

The degree of satisfaction obtained from QRP operation depends on the interests and temperament of the operator. If you are interested in working DX on 20 metres, and don't like to have the second best signal on the band, or hate other guys tuning up on top of you right when you are in the middle of a rare DX QSO then QRP operation may not be for you. If you are patient, enjoy experimenting, and are prepared to forgo operating when conditions are poor, then QRP operation might appeal to you. When running low power, the adage that if you can hear 'em you can work 'em is no longer true. An S3 signal in the clear is quite readable, and while you can hear *him* without difficulty he will *never* hear you. This means that the QRP operator can never make as many contacts as the station running 100 watts. Nevertheless it is possible to make many enjoyable contacts. From my QTH near Newcastle it is possible to work the east coast and across to ZL on 80 metres when the static is quiet. If the static is noisy then forget about operating, you will get less frustrated reading a book or something. For local work 80 metres is the best. Typical reports range from S5-S7. On 20 metres distances covered are

greater, but power is lacking, as shown by typical reports which range from S2-S7.

It is possible to work long distances — even across to the States on very rare occasions, as my log shows. More often a QSO goes something like this — S7 station calls CQ. QRP station answers. S7 station comes back — ur sig R5 S3-S5 with QSB. QRP station makes grand revelation that it is running 5 watts. S7 station seems more tolerant of weaker signal, sometimes even impressed (you are really doing well with 5 watts) but this does not help when signals drop out because of fading, or just as often when some criminal type starts tuning up on top of you.

So there it is. What the big American glossies say about working the world with low power is true; you can, but there are problems. You will need a beam, which I do not have, and a lot of patience. In wars of interference you lose. Every time.

Nevertheless I enjoy QRP operation and I enjoy using the little 509. It is educational; the PTT is almost as good as VOX, the CW break in is a delight to use, and more importantly this set will encourage buyers to become builders. It is very hard to assemble a whole station these days. But if you buy a little 509 then you will probably end up brewing too. Things like a linear. 50 watts would be nice. That is unless you buy a linear. Shame.

TABLE 1

Front panel controls of the Argonaut 509. Bracketed comments show switch positions as rotated in the clockwise position. Resonate or receiver RF tuning.

Bandswitch (80, 40, 20, 15 and 10 metres). Main transceiver tuning (both RX and TX). RF gain control — maximum attenuation 25 dB approx.

AF gain control + power on off — push on.

Mode (Sideband reverse, CW, sideband normal, "lock" or tune up).

Drive (ganged RF drive and mike gain controls).

Meter switch (S meter, forward power, reflected power).

Clarifier (pull off push on on the potentiometer).

TABLE 2

Dial setting and actual frequency for the Argonaut 509. Measured on a Marconi TF2416 frequency counter. This band is typical of the others.

Dial Setting	Actual Frequency
14000 kHz	14000 kHz
14050	14052
14100	14102
14150	14151
14200	14198
14250	14246
14300	14293

A METHOD OF REDUCING HV POWER LINE NOISE

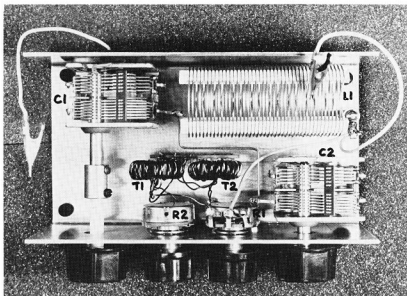
Drew Diamond VK3XU

55 Winbirra Pde., Ashwood, Vic., 3147

Many amateurs have HV power lines running near their location. These lines have a habit of developing leaky insulators, resulting in a particularly objectionable noise level. At this location is can reach levels in excess of "S9".

The problem is therefore, how can this noise be eliminated or reduced? Consider that this particular source of noise has three salient features; it is coherent, has a fixed location, and a fairly constant level in the short term.

Though I do not think it is a new idea, this little circuit appears to offer a solution. Two antennas are used. One is a "noise" antenna and the other is the main antenna for the particular band in use. The noise antenna must be located in a position where it will receive the maximum amount of noise and minimum of wanted signal. The main antenna is of course just the opposite. The noise antenna could consist of about 10 metres of hook-up wire run along a wooden fence or under the eaves of the house in such a position that it will receive a large noise voltage.



Method of Construction and Layout.

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PETER SCHULZ, VK2ZXL.

At this location it runs under the eave down one side of the house towards the HV line in the street.

Consider the circuit. The heart of it is T1, a transmission line transformer. The noise sample is propagated along b,a, and signal plus noise along c,d in the opposite direction. The net field from these two in-

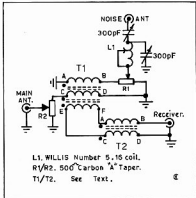


FIGURE 1

fluence e,f. Now ideally, if the noise field along b,a was equal in amplitude and phase to the noise component in c,d, it would leave only signal component in e,f, which is coupled via balun T2 to the receiver.

It would be unlikely, of course for the above situation to occur, so I have included some adjustments. R1 and R2 are used to adjust the amplitude of noise components from each antenna to equal each other exactly. C1, C2 and L1 form a matching network so that the impedance of the noise antenna can be matched to R1/T1 on any HF band.

All the components are mounted in a simple U shaped box 8 x 5 x 15 cm. C1 is supported upon insulating posts and has an insulated shaft to the knob. Number 3 knitting needles are a good source of material for insulated posts and shafts. is soldered to the tag of C1 at one end and to a little insulated post at the other. A small clip lead is used to connect the noise antenna and another lead for tapping L1.

T1 and T2 are wound on Q2 toroidal formers about 2 cm in diameter (just

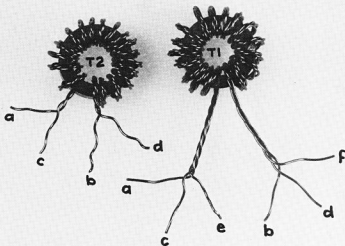
about any core will do) and are critical in only one respect, the connections must be right. Number 22 B & S enamelled wire is used. For T1, cut off three lengths each about 50 cm long and for T2, two lengths about 60 cm long. T1 is trifilar wound. Twist the three wires together at one end and clamp about 2 cm in a vice. Twist the other ends together and fix them firmly in the chuck of a hand drill. Give the drill a few tugs to take out the wrinkles, then twist them up to about two twists per cm, at the same time keeping the wire taut. The two wires of T2 are twisted up in the same manner. The number of turns for T1 and T2 is not critical, just fill the formers neatly as shown in the photo. Remove the insulation from the ends, and using an ohmmeter, locate the respective wires ab, cd and ef. Join a to d. Pair off e and f which leaves b and c.

Adjustment is fairly simple. A good level of noise voltage must first be established. Turn R1 to max. and R2 to min. Then adjust C1, L1 and C2 for maximum received noise. Now R2 is advanced to max. and R1 to min. Rotate R1 from min.

and a point will be reached where the noise will drop. Alternately adjust R1 and R2 for best noise null but try to achieve this with R2 near its max. setting. If a null is achieved too far down R1 and R2, receiver noise begins to become apparent. Some final adjustment of C1 and C2 may be necessary. A piece of plain cardboard could be placed behind the knobs upon which the settings for each band are marked.

I see no reason why this circuit could not be used at VHF for radio or TV reception. The noise antenna could be a small, low beam pointed at the source of noise. The Z matching becomes unnecessary of course, R1 and R2 should be step attenuators with 10 and 1 dB steps.

The device seems to be particularly useful when the noise has reached S6 or more. During periods when the level has reached S9 it is possible to restore an otherwise unusable band. Sometimes, unfortunately, it appears to be impossible to obtain a deep null on the noise, due possibly to there being more than one leaky insulator in the area.



Transformer Windings

LIVING WITH LOGIC

Are you baffled by what goes on inside those mysterious black caterpillars which seem to be everywhere these days? Like so many of us, the author admitted he was confused, so he began to "learn by doing".

It has become obvious to me over the past few years that unless one is familiar

with logic techniques it is increasingly difficult to keep up with new developments. I had read numerous texts, and built a Digital Frequency Meter. This was a "Meccano" type project; solder ICs into ready-made circuit boards, do some interconnecting, and it works! As to understanding how, I was not progressing. Something had to be done about it. Reading the books seemed useless; I had to build something so I could see it working!

LOW SPEED

My answer to the problem was to build some simple logic devices and operate them at a speed low enough to see the results on input and output indicators. So I purchased a 7400 Series Data Book, a handful of assorted ICs, some LEDs, and some 0.1 inch Matrix board to mount the whole thing on. The total outlay was about \$18.

The 7400 Data Book is a mine of information, not as a study text, but as a refer-

Harry Moores VK4JL
6 Thomas St., Wilston, Qld. 4051

ence book while work proceeds. Don't regard the ICs just as black boxes, but try to get at least a sketchy idea of what happens inside the individual units. Forget about the detailed circuit diagrams of the internal components shown in the book. Concentrate on the block diagrams showing interconnections between the gates and flip-flops within the chip.

Before we can look at the pulses going through the ICs, we must have something to generate them. A 555 is ideal here, cheap and easy to get going. Use values in the timing network to give about 30 pulses per minute at about a 50 per cent duty cycle. Use a potentiometer for the timing resistor (R1 in the data book circuit) so that the rate can be varied.

DECADE COUNTER

Now let us look at the 7490, a decade counter. The data book tells us that as well as dividing by 10, the 7490 has another interesting function; it can give a Binary Coded Decimal output as well. Referring to the data book, connect up the IC to divide by 10. Connect a LED to show the input pulses, and other LEDs on each of the four BCD outputs, arranged on the board in the correct sequence ABCD (or 1248). Copy out the BCD code up to 10 on a piece of paper if you are not familiar with it, and then apply the necessary 5 volt supply to the system.

Looking at the four output LEDs, we find we can follow the BCD count up to 9; but the divider is supposed to count to 10. The data book shows the 7490 is triggered by the trailing edge of the pulse. Is this the answer? (No, Harry. 0000, zero, is state 1. 1001, nine, is state 10. — Tech. Ed.).

Although we can read the BCD count, it is not a very convenient display. Let us use a 7 segment LED display to show the decimal equivalent of the count. Listed in the data book are several ICs which can take a BCD count and convert it into suit-

able pulses to operate various types of display, for example a 7448 BCD to 7 segment decoder-driver. Avoid the mistake I made of choosing a 7448 and then a common-anode display. The outputs of a 7448 are positive pulses to drive a common-cathode display, so I had to use seven inverting transistors. (Or else use a 7447. — Tech. Ed.).

Now we find we can follow both the BCD and the decimal count of our pulse source. While this is interesting, it is not much use. Let us see if we can count rate, i.e. frequency. To do this we must stop the count after a set period of time. If we remove the input to the 7490 while the count is progressing, we find both displays retain the last number counted. The 7490 has a memory. At this stage see what you can find out about JK flip-flops (the works of the 7490).

RESETS

In the data book we find that the two resets on the 7490 have to be at 0 (or ground) for it to operate, so while still holding the count we may put a 1 (or plus 5V) on one of the reset lines: the count returns to zero.

At this stage let us put a timebase into the system. As we are counting only 30 pulses per minute we need a gate open time of at least 20 seconds to count up to 10. Using a conventional oscillator we would need a very long chain of dividers, so we will use a simpler method which would not be accurate enough for practical purposes, but is sufficient for demonstration. Note that with this system it is not only the timebase frequency but also its mark to space ratio which controls the counting time. This timebase will be another 555 with timing constants to give about 3 pulses per minute.

Now to look at the operation of a gate. Use one gate of a 7400. Connect the pulse generator (clock) to one input, and the new 555 timebase to the other. Connect the output to the 7490. As the 7400

is a quad NAND gate (i.e. four gates in the package), a zero will only appear at the output when there is a 1 on both inputs. The gate can only open during the "on" time of our timebase, when the pulse generator output will then appear inverted at the output of the 7400.

We now find that our count goes up to a certain number, holds there for a while, and then continues. Obviously we must reset it before the count commences again. So use another gate of the 7400, this time with one input at 1 (5V), and the other connected to the timebase. While the timebase is at 1 a 0 appears at the output, which we connect to the reset line, and the count continues. But as soon as the timebase goes to 0 a 1 appears on the reset line and the count is returned to zero.

DISPLAY TIME

Now we see that our counter counts to a number, immediately resets to zero, and holds there until the count recommences. To improve the presentation I put a U.v. with a time constant slightly less than the timebase off time in the reset line. Now we have a real counter, which can count up to a number, display it for a period, reset to zero and restart counting.

You may well ask "What use is this device?" For a practical application the answer is "None". But I learned more about the operation of logic devices with this than with all the previous reading I had done! I am now going to pull it apart and use the bits as part of a digital dial readout for a VK4ZEL exciter. This will entail more sophisticated clock gating and resetting, and the use of latches. It is all in the data book!

I have deliberately not included any circuits or component values in this description, as working from the data book is part of the exercise. One final word of warning; do not forget limiting resistors in series with the LEDs. ■

FIXED WIRE BEAMS CHEAP BUT EFFECTIVE

When one hears of/refers to, beam antennas, it is natural, in these times of commercialised "amateur" radio, to assume that it is the rotatable, aluminium, trap-loaded variety under discussion — this need not be so.

For simplicity of construction and price, the fixed wire beam takes a lot of beating for the performance it can give.

Commercial and military fixed services (point-to-point) often rely on just this type of antenna to establish and maintain efficient and effective communications. Why not the amateur then?

If you are one of those ops who has a pet frequency and direction for working, then read on — this could be a high gain, direction antenna of use to you.

On the matter of directivity too, remember that most HF uni-directional arrays when correctly tuned, have a forward lobe

spanning an arc in the order of 50 degrees. Look at that arc on your great circle map — it covers a lot more territory than one initially thinks when speaking in terms of "directional" antennas.

If we compare the aluminium tubing and wire beams physically, we notice a difference in element diameter to length ratios of course. In addition, we find a slight capacitive effect on the wire beam, not present on the tubing type, due to the influence of the insulators supporting the ends.

David S. Down VK5HP
17 Brodie Cres., Christies Beach, S.A., 5165

Because of these differences, certain modifications are required when wire is used for the elements in lieu of aluminium tubing.

When constructing a 4 element fixed wire beam for the 1975 CQ WW CW contest, these factors became apparent and it is the intention here, to pass on some of the relevant information gleaned from both references, and practical experience.

For the uninitiated, the most common forms of wire beams in use are the quad and ZL special, but it is not the intention of this article to go into detail on either — so much has been written for so long on these regulars.

Two and 3 element fixed wire beams can be built for a few dollars, without giving away any performance to the more costly rotatable arrays. Construction time is about an hour and a half, and that elusive hi-gain 40 metre array is a real possibility (no traps either!)

For matching convenience to 75 ohm coax or tuned feeder, the driven element in each case is folded. Your choice of matching transformer or alternative methods of feeding is, of course, available.

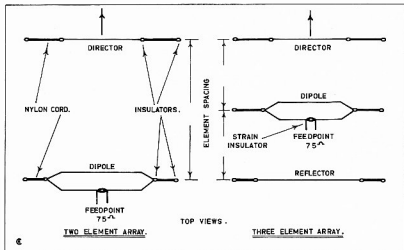
I used 12-gauge hard-drawn, copper wire (pre-stretched between car and carport!) for the elements and erected separate supports for each element on the 4 element version due to the non-availability of 25 foot lengths of spreaders in my junkbox — again, this arrangement lends itself to individual requirements.

The antenna is arranged in a horizontal

plane as shown and is of the uni-directional type. As with all beams, the array should be elevated as high as possible, with 10 metres being the bare minimum. It is also important for the feedline to drop vertically from the driven element

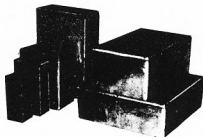
for as far as possible (ideally, at least 20 feet).

Dimensions are given for 2 and 3 element arrays for the 40, 20, 15 and 10 metre bands, and these should be followed very closely.



BAND	DIRECTOR	DIPOLE	REFLECTOR	SPACING
40 m	62'6"	66'2"	70'4"	16'
20 m	31'3"	33'1"	35'2"	8'
15 m	20'10"	22'1"	23'6"	6'6"
10 m	14'10"	16'	17'4"	4'

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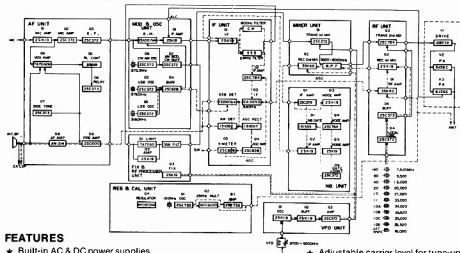
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Solid State 160 thru 10 Meter Transceiver

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FEATURES

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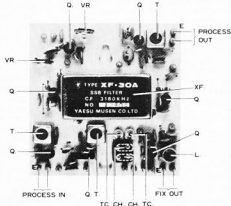
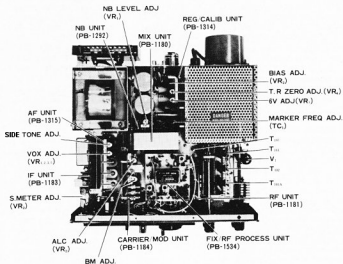
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— With latest model RF speech processor including front panel adjustment.



All new built in R.F. Speech Processor with front panel level control.

TECHNICAL DATA

GENERAL

Frequency Range: 1.8-2.0 MHz, 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 27.0-27.5 MHz, 28.0-30.0 MHz all full transmit and receive. WVV 10.0-10.5 MHz (receive only). One auxiliary 500 kHz segment is available except for IF and VFO frequency range. Heterodyne crystal for 1.8-20 MHz is available optionally. (NOTE: All our sets include this crystal).

Mode: Selectable USB, LSB, CW or AM.

Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100 Hz with 10% line voltage variation.

Calibration Accuracy: 2 kHz maximum after 100 kHz calibration.

Backlash: Not more than 50 Hz.

Antenna Impedance: 50 to 75 ohm unbalanced nominal.

Circuitry: 40 Transistors, 3 integrated Circuits, 36 Diodes and 3 Tubes.

Power Requirement: 100/110/117/200/220/234 V AC, 50-60 Hz, 350 Watts maximum, or 13.5 V DC nominal, 5 A for standby, 0.5 A for receive (Heater OFF) and 20 A for transmit.

Size: 340(W) x 153(H) x 265(D) mm.

Weight: 15.9 kg (35 lb; wt.: 20 kg)

RECEIVER

Sensitivity: 3.0 μ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz.

Selectivity: 2.4 kHz nominal band-width at 6 dB down, 4.0 kHz at 60 dB down on SSB, CW and AM, 600 kHz nominal bandwidth on 6 dB down, 1.2 kHz at 60 dB down with optional CW filter.

Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal below 1 μ V equivalent to antenna input.

Automatic Gain Control: AGC threshold nominal 3 μ V. Attack time 8 milli-Second and release time 1800 milli-second.

Audio Noise Level: Not less than 40 dB below 1 watt.
Audio Output: 3 Watts to internal or external speaker at 4 ohm impedance.
Audio Distortion: Less than 10% at 3 watts output.

TRANSMITTER
Input Power: 260 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM except for 160 metre. (Slightly lower on 10 metre).
Carrier Suppression: -50 dB.
Sideband Suppression: -50 dB.

Spurious Radiations: -40 dB.

Distortion Products: -30 dB.

Frequency Response: 350 to 2700 Hz \pm 3 dB.

Final Tube: 6J56C x 2

All prices include S.T. Freight extra. Prices and specifications subject to change.

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82 2854

NEWCOMERS NOTEBOOK

Rodney Champness, VK3UG

David Down, VK5HP

AN AERIAL TUNING UNIT FOR AERIALS SHORTER THAN 1/4 WAVE LENGTH OR JUST SHORTER THAN 1/2 WAVELENGTH

This aerial tuning unit has been used on 160 metres with considerable success and could be used on other bands such as 80 metres with no modification. Having tried a few aerial tuning units which did the job of matching the transmitter to the aerial in a mediocre way, I had the good fortune to have first hand experience of using a system similar to that now described.

The output tank circuit of the average amateur transmitter is designed to transfer maximum power into a load of approximately 50 ohms impedance. When an attempt is made to load such a transmitter into a load which is significantly different in characteristics to that for which it was designed, you have quite a few problems trying to get it to load, as I did.

T1 is the impedance matching auto-transformer. It consists of a toroid of about 3 inches in diameter wound with 58 turns of enamelled copper wire. The wire is wound twice around the circumference of the toroid spacing the turns so that this occurs. The wire at the low impedance end is wound with 14 gauge B & S wire for about a third of the winding, and then the rest is wound with 18 gauge B & S wire. The toroid is first wrapped with plastic insulation tape and then the wire is wound on starting at the earth end of the winding. The 5 ohm tap occurs at the 13th turn and progressing further up the taps occur at the 15th, 17th, 20th, 23rd, 26th, 30th, 35th, 40th (50 ohms) and 48th turn. The winding continues to the 58th turn which is the 105 ohm tap. Each of the required taps is made by raising the wire a fraction of a centimetre off the toroid, scraping the insulation off it at that point and soldering a length of wire to it

long enough to go to the switch, S1. The tapping points might appear a bit odd, but they are arranged going down from 50 ohms to be approximately 75 per cent of the previous value, 38 ohms is approximately 75 per cent of 50 ohms and 28 ohms is approximately 75 per cent of 38 ohms. This makes for an autotransformer with a much smoother transition of impedances which means it is easier to select the correct aerial impedance.

Some years back Phil Williams VK5NN built a tuning unit something similar to this one. He used a TV horizontal output transformer core as the former for T1. I have no doubt that it will work as well as mine and may be more easily obtainable.

T1 matches the resistive impedance of the aerial system but the reactive element has still to be balanced out. L1 is used to balance out the reactance of the aerial. I use a rotary inductor with a coil diameter of about 5 centimetres within a total of about 60 turns on it over a length of 12 centimetres.

Rotary inductors are not all that easy to come by so a coil of up to 60 turns can replace L1 used with an 11 position switch to select tapings on the coil. The exact tapping used on the coil for any particular part of 160 or 80 metres depends on the aerial in use, as does the impedance tap on T1 that is used.

A thermo-couple ammeter can be wired into the circuit either between S1 and L1 or after L1 and before the aerial. These ammeters will register the amount of RF current going into the aerial, and by squaring this current and multiplying by the impedance tapping used on T1 the amount of power out of the ATU can be reasonably accurately calculated. Thermo-couple ammeters are hard to come by so I decided to try the current transformer idea that I had seen in a copy of "Electron", the Dutch amateur radio magazine. T2 has a toroid ring of 14 mm diameter. Through the centre of the toroid is passed the wire from S1 to L1. Four turns of insulated wire are wound on the toroid and then taken off the RF detector and metering circuit. With the 5k ohm trim pot at half travel the 1 mA FSD meter registered 3.3 amps of aerial current. The scale is fairly linear down to a third scale and then becomes progressively non-linear such that

a current which should read a fifth of FSD only reads a sixth and so on.

More turns can be wound on the secondary of T2, although I would think that 5 to 6 turns would be enough even with a very low powered transmitter. The value of the two resistors can also be altered to give almost any range that the builder desires. The toroid is one available from Elcoma but I think that any orders for parts from them carry a certain minimum quantity and total transaction price requirement. Some builders may like to wire a small pilot lamp across the secondary winding of T2. Depending on the voltage of the lamp, the number of turns on T2 and the power of the transmitter will determine the brightness of the lamp. The brilliance of the lamp will increase with modulation on an AM transmitter, the meter will, however, stay stationary if there is no carrier shift.

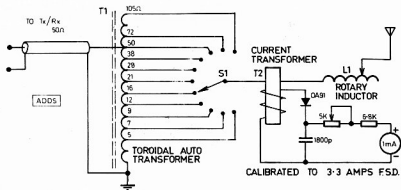
Normally, the transmitter is tuned into a 50 ohm dummy load, then transferred to the aerial via the aerial tuning unit. Without touching the transmitter controls starting with S1 set to a low impedance run L1 through its range noting the maximum reading on the meter. Try the next impedance tap and take L1 through its range again stopping at the point where maximum current is indicated by the meter. Continue this progression through the taps on T1 and adjusting L1 for maximum indicated current until you come to the point where you find that one particular tap on T1 and one setting on L1 gives the maximum meter reading. The aerial tuning unit is now tuned for maximum transfer of power from the transmitter to the aerial. The aerial system is also matched to the receiver and I obtained 1 S point gain through the use of the ATU. During the process of tuning the ATU give the transmitter a bit of a rest every few seconds as it could be drawing excessive plate or collector current at times.

This simple aerial tuning unit works extremely well and should do so for you too. It appears to have no vices that I can detect and all controls work the way they should. Hope to hear you with a better signal on 160 metres soon. If you intend to use it on higher bands than 80 metres, a low loss toroid should be used. A smaller toroid could be used too.

AFTERTHOUGHTS

People who are members of The Eastern and Mountain District Radio Club will have read this article in "The Radio Bulletin" for May 1976. Lin Brown VK3ARL read the article and came up with an amendment to the RF metering circuit which was featured in June 1976 issue of "The Radio Bulletin".

The toroid T2 not being readily available, Lin tried out a balun core as used in TV tuners. These are the 2 holed ferrite cores measuring about 10 mm x 10 mm x 5 mm. The aerial wire is passed straight through one hole and 4 to 6 turns of fine wire is wound through the second hole and over the outside of the core to form the secondary winding. The rest of the circuit is as original. Thanks Lin. ■



COMMERCIAL KINKS

Ron Fisher, VK3OM
3 Fairview Ave.,
Glen Waverley, 3150

After our discussion on the TH6DXX antenna last month, a logical extension of this is a useful hint on the HAM-M and HAM-11 rotators. Geoff Wilson VK3AMK is again the author.

To follow this is a simple hint to improve the quality of the internal speaker on the Yaesu FT101B, again by Geoff; and to finish up this month a simple modification for the KEN KP202 hand-held transceiver. Firstly though over to Geoff for his two hints.

HAM-M AND HAM-II ROTATORS

If you don't wish to depend upon the motor unit to provide a low impedance earth path between the upper and lower mast a very quick and simple modification can be made. The materials required are readily available on most shacks: 2½ x 3 ft. of RG-8U coax (old if on-hand is perfectly suitable) and two ¼" hole solder lugs.

Firstly strip the outer PVC covering from the coax but don't damage it. This is a tricky operation but gently heating it with a hair drier will soften it and, with one end of the braid and inner cable held in a vice, the outer covering can be eased off. Next push the braid off the inner insulation and flatten one end and solder or crimp to one lug. Attach this lug to the ¼" bolt in the centre of the upper mast clamping plate, screwing it tight.

Ensure there is enough braid to reach from the upper clamping plate centre bolt to the same bolt on the lower mast clamping plate (allowing for the full rotation of the unit of course). Attach the other lug and pass a couple of feet of wire through the hole and twist the end of the wire to hold it. Push the wire through the PVC tubing and pull the braid through until the tubing reaches the upper lug. Attach the lower lug to the bolt in the centre of the lower clamping plate and it is complete. The tubing over the braid will prevent the braid scratching the rotator paint and protect the fine braid from abrasion.

FT-101B INTERNAL SPEAKER

The cover plate on the underside of my FT101B was so close to the plate holding the internal speaker that at certain audio

frequencies the cover plate produced a very annoying rattle. This was cured by cutting a piece of thin foam rubber (approx. 1/8" thickness) to fit around the edge of the speaker plate and holding it in place with a few drops of contact adhesive. The rubber then acted as a buffer between the speaker plate and the cover plate and the problem was solved.

IMPROVING THE TRANSMITTED AUDIO OF THE KEN KP202

The transmitted audio from the KEN 2FM transceivers seems to vary from quite good to very poor. The latter state usually shows up as an excess of high frequency response plus some harshness or distortion.

Having just acquired a KEN that came into the above class, I decided that a solution was required. The cause appears to be quite wide variation in the microphone inserts supplied in the KEN. The cure is simple. Just connect a 2 mfd disc ceramic capacitor across the output connections of the microphone. The capacitor should be of the 25 volt type about the size of a five cent piece. It is connected with short leads and folded flat against the back of the microphone insert, there will be no trouble getting it to fit. ■

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 5233

AMATEUR BAND BEACONS

VK0	VK0MA, Mawson	53.100
VK0	VK0GR, Casey	53.200
VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
VK2	VK2WI, Sydney	144.010
VK3	VK3RTO, Vermont	52.600
VK4	VK4RTI, Townsville	52.600
VK4	VK4RTT, Mt. Mowbulla	144.400
VK5	VK5VF, Mt. Lott	53.000
VK5	VK5VF, Mt. Lott	144.800
VK6	VK6RTV, Perth	52.300
VK6	VK6RTU, Kalgoorlie	52.350
VK6	VK6RTW, Albany	52.850
VK6	VK6RTW, Albany	144.500
VK6	VK6RTV, Perth	145.000
VK7	VK7RMT, Launceston	52.400
VK7	VK7RTX, Devonport	144.800
VK7	VK7RTW, Lonsdale	52.475
VK8	VK8VF, Darwin	52.200
3D	3D3AA, Suva, Fiji	52.500
JA	JA1YAA, Japan	50.110
HL	HL3WJ, South Korea*	50.110
KG8	KG8JDX, Guam*	145.200
KH6	KH6EQI, Hawaii*	50.104
ZL1	ZL1VHF, Auckland	145.100
ZL2	ZL2MHF, Upper Hutt	28.170
ZL2	ZL2VHP, Palmerston North	52.500
ZL2	ZL2VHF, Wellington	145.200
ZL2	ZL2VHF, Palmerston North	145.200
ZL2	ZL2VHF, Palmerston North	431.850
ZL3	ZL3VHF, Christchurch	145.200
ZL4	ZL4VHF, Dunedin	145.400

*Denotes addition.

It appears the beacons in South Korea and Hawaii are still running continuously, so they have been re-included for your information. News from overseas via VK6ZY mentions quite a lot of beacons operating in the U.S.A., Canada and Alaska as well as some Pacific areas. It seems there could be more chances of very long haul DX when the sunspot cycle becomes more suitable, but it will

require VK stations to monitor the 50 MHz end of the band. I guess that none of us do this as often as we should, and really never know how many lost opportunities may have been taken — one of the disadvantages of our 2 MHz separation from other call areas, fortunately however, our beams will work better down to 50 MHz than they will at 52 MHz, so that may be some compensation.

Peter, VK6ZY has sent me copies of the July issue of SMIRK, from Texas U.S.A., which has much information on 50 to 54 MHz as it affects the northern hemisphere in particular. Probably of interest to many will be some extracts by Ray K5ZMS and I quote "My guestimate that this would be a great year for DX on 6 has exceeded my wildest expectations. (Remember, northern hemisphere has just been through their summer DX season . . . 5UP) K7L's IBG and HLE have worked VE1ASJ and W1's worked VY5ZZ. JAs worked KH6J; JH1WGT being heard in Pacific NW; C6A, ZF1XW, most of the VEs, VO1MO, KP4's, CO2KK, XE1B and FE, KHE's worked W6's, NM and NW7's, PJ2DW and VP2LAW. All these countries have been worked this year. VE1ASJ became the first to work the VY5ZZ station, doing it during the Field Day.

"We have had one of the best E summers in years. The foreign DX has been great, and we have finally interested many people to get back on 6 metres. I was the first to hear the W6SMX beacon on 50.195, 10 watts out. If you hear it, call on 50.110. It runs 24 hours a day. I also hear that KH2's beacon on 50.103 is on again. If you hear it call on 50.140."

It certainly appears the northern hemisphere had a ball this year, with so many openings to everywhere. If this is an indication of the situation during the low of the sunspot cycle, it must surely mean there are many more stations now with 6 metre capability, and as the DX seasons improve then surely VK must participate to some degree in those extreme distance openings.

Thanks for that letter Peter, VK6ZY, and it is noted you fell in at a new QTH from Nevada at a height of 1100 feet a.s.l. I wonder why you chose that situation? Peter also points out that the 14 JAs which made it to KH6 on 7/8th July were covering approx. 3500 miles, and to W6 about 4000 miles; W6 to KH6 about 2500 miles. There are some good hauls there and it ought to be possible to obtain similar distances from VK. It looks as though you guys on the east coast of Australia should be doing more during the warmer

weather to extend your distances into the Pacific area, using HF to set up links where possible.

A letter from Selwyn ZL2BJO advises dates of their VHF contests as follows: 7/11/76 six metres only, four one hour periods 1000 to 1400 NZ daylight time. As these times have not been given to me in GMT I can only suggest NZDT will probably be 3 hours ahead of EST, instead of the normal 2 hours, making the correct times 2100 to 0100Z, 4/12/76 0400 to 1000Z; 5/12/76 1800 to 2400Z. All bands used, 14/15 Feb. 1977, DX Field Day, times not yet finalised.

Could I ask everyone submitting times for contests and field days to please make the times in GMT. This effectively takes care of different daylight savings time, simplifies my work. Thanks. Therefore, I do hope the above mentioned times will be correct.

As an indication that the 6 metre band is open a lot more than you think during the winter months, take a note of these contacts made by Barry VK2ZAY at Gunnedah, most signals being 5 x 9; ZK2VZLJ, 2X0/S VK4MS, VK4TL; 27/6 VK5BU; VK5ZVQ, VK5ZSA, VK5MT; 17/1 VK4TL, VK4RD; 22/7 VK7ZGJ, VK5ZZZ, VK5ZTX and VK5XMM.

Kerry VK5SU/2 now residing at Moore has written to say all his gear has arrived from Ceduna, and he looks like being fully operational by the time the real DX starts coming through. Currently he has 11 elements on 2 metres FM, 11 elements on 2 metres SSB and a 4 ft. on 6 metres. First VHF contact from Moore was to Joe VK7ZGJ on 6/7/76 using the FTV650 to a 40 metre dipole!

Kerry is able to work Barry VK2ZAY (110 miles) every day on 144.1 SSB, and was able to make an initial contact with him using his 2 element portable beam. The noise level of the noise-free, and SSB are 5 x 9+ subject to QSB. Others he has worked on 144 SSB are Chick VK2KQ at Narrabri (60 miles), Reg VK2ATS at Inverell (85 m) and Alan VK2ASI at Tamworth (135 m).

Kerry reports SSB is the favoured mode in northern N.S.W. and he is particularly keen to contact the Queensland boys, as the VK4RTT beacon at Mt. Mowbulla is frequently audible at up to 9+ with long QSB. The beacon is approximately 210 miles NE from Moore. Kerry will keep an ear open for travellers on Channel 40 FM when home.

Phil VK2DY is now active also from Moore using an FT200 and Europa B to 11 elements hori-

zonal at 40 feet. Phil also has 2 m FM, Phil comes from Toowoomba, and Kerry mentions when next he returns there he will be trying to stir up some interest in the southern directions. Pat VK2ZXB is due in Moree on transfer from Ceduna and has an IC22A. Gerry VK2BGK is also due on transfer and is keen on FM operation. Dave VK2CAD is at Moree and uses 2 metres FM. And there are others in this town of 10,000 people who look like having their interests stirred again by Kerry. My thanks to Kerry for once again writing, and I have given his letter some prominence as this is the first real report we have had of 2 metre SSB operation from northern N.S.W. And they are situated at a nice distance to VK5 for Es contacts when the band is right, so once again all you guys with 2 metre equipment, watch the band closely from October onwards especially, what with Moree and associated lesions, plus the increased interest in the more northern areas of VK4, it seems we could yet have some good haul DX on 144 again.

Steve VK3BIZ writes to report a contact between HLWJ and JDIAMF on Ogasawara Island, south of Japan. Hiro JA1LZK was operating as JDIAMF on this his second DX-pedition to Ogasawara Is. from 1st to 10th August. JDIAMF had a beacon running on 50.110 during the evenings. P290J and VK4MS are running nightly skeds on 52.050 at 0730Z. P29BH and P290J will both be active on 6 metres this summer. Steve predicts that September and November will be the months to watch for serious DXworking. He also mentions that the mailing address of Bill Boykin, HLWJ, is HQ, 8th Army Engineers, Korea, A.P.O., San Francisco, 96301.

Thanks Steve for your letter, let us hope you will not be too disappointed with 6 metres from your new QTH, which appears to be prime Channel O area!

432 MHz ACTIVITY

John VK7JV is now active on the band, with approx. 200 mW to a 16 el. yagi. Joe VK2ZGJ of course is also there. Tests between Keith VK5SV and myself VK5LP have been carried out over 35 mile path of hilly country with good results. There seems to be no difference between 432 and 144 MHz as far as we can see for our path. I am running about 40 watts output from a 2C39A to a 13 el. yagi at 67 feet, Keith in the next day or two will be lifting his 10 watts also to 40 watts and the same type of antenna.

E.M.E. ACTIVITY

Lyle VK2ALU sends his monthly notes via "The Propagator". He writes: "A scheduled EME test was made on 3/7/76. Those present were VK2ALU, VK2ZEN, VK5LP and Ken Grimm. The first EME test was with SM5LE and a contact was made; he

gave us an M report but we could only give him a T report due to interference experienced from auto ignition. The next test was with PA0SSB, who was worked with M reports both ways. His signal peaked to 8 dB above noise at the start of the test, but faded during the half hour. The final test was with LX10B, who was not heard. Our echoes peaked at 7 dB above noise.

SM5LE requested EME tests on 30 and 31/7 and 1/8. We had the first VK-SM 70 cm contact with SM5LE on 30/7, signals were M copy both ways. We did not hear any signals from HK1TL during the test on 1/8. Another station we heard near the frequency but the call sign could not be fully identified. As a matter of interest HK1TL in Colombia, South America, was a portable operation, with all the moonbounce equipment, antenna and personnel coming from WGCCX in U.S.A. Their portable gear weighs 1368 lbs. and all had to be airfreighted.

A QSL card was received from W1JAA for our first EME contact with him, made in June. He is our second longest distance contact, with a point-to-point distance of 10,110 miles (16,270 km.).

Lyle also mentions they are always happy to have visitors come along to the moonbounce tests and it would be a pity if anyone failed to ensure they arrive before the tests commence, or do the last 200-300 yards on foot, as their receiving system is VERY sensitive to auto ignition noise! (With that I can agree — 5LP).

GENERAL INFORMATION

I note with interest the last issue of "Forward Bias" from Canberra, was printed by the "Photocopy" process. The chief advantage of this is that the resolution of the printing is much greater than the previously used duplicator system.

Arie VK3AMZ is looking for long haul tropospheric scatter contacts on a regular basis, either CW or SSB. Each week night from 1930Z onwards Arie is looking towards the N.E. and N.E.E. from Melbourne. Frequencies used are 144.000 for CW (this mode preferred) and 144.100 for SSB. Any takers?

The Geelong Amateur Radio & TV Club Newsletter contained the above item. It also has an interesting comment in the President's report which reads: "It is looking towards the Club and for some time that although the population of Geelong has expanded in recent years the amateur population has remained dormant. This situation should not be tolerated by Geelong amateurs, we must have the numbers if we are to survive and enjoy our hobby. To do this we as amateurs must support schools, clubs and organisations who promote amateur radio."

"This year the Club is about to take a bold step in promoting amateur radio by conducting

classes for the novice licence. These classes will be open to the public and will be conducted by qualified teachers".

It is commendable to see someone is being voiced in Geelong, as it has in some other areas, and it is to be hoped that their efforts will be rewarded in the long run.

David VK5KK is currently constructing SSV equipment for use on both HF and VHF bands, so that will be another mode of operation to come out of that shack.

The VK5 mid-north repeater is now in operation. The Bluff near Port Pirie, and is operating on new Channel 2. Reports welcome. Call sign VK5RMN.

Stan 2L4MB writes with some news of activity from across the Tasman. He mentions "Six metres last summer was a very poor, with only one contact outside Dunedin, to a VK7 that was poor. This coming summer he will be home operating from hilltops."

"On 20th and 21st November there will be activity on 52, 144, 432 and 1296 MHz from Dunedin to Christchurch with Russell ZLATAG, Ronald ZLATAG, Brian ZLATAG and Stan 2L4MB at the Dunedin end, and Vern ZL3AQ will be joining them for the weekend. From Christchurch Max ZL3AAN and Ray ZL3TBS will be operating. Included in the activities will be operation through Oscar 6 and 7, and a special invitation is extended to VHF operators to participate in any of the activities where practicable. Operating times look like being 2100 to 2300Z and 0000 to 0400Z each day, from the top of one of Dunedin's hills."

"4/5 December they will be supporting the VHF/UHF National Field Day. See ZL3TCW at Timaru, as well as operating in the Field Day also should have his 150 foot tower in operation before Christmas and looking for trans-Tasman 144 MHz DX. Keep an ear open for him. Overall, it seems there will be quite a bit of 6 metre activity from New Zealand this year."

There doesn't seem to be much else to report now, so will start closing. However, as this appears in October we will be hearing the increased DX activity on both 6 and 2 metres, so if all those stations in all those States really do become keen on DXing, we may see some very good contacts. Southern States will certainly be looking towards northern N.S.W. and Queensland this year for 144 MHz SSB, so remember 144.100 is the calling frequency. On 6 metres it is 52.050. But keep an ear on the area 50 to 52 MHz especially during October and November."

With those few words I close with the thought for the month of November, "Have I determined whether the early bird enjoys the worm as much as the late bird enjoys the extra sleep?" 73.

The Voice in the Hills.

AMATEUR NEWS

The Deputy Secretary-General of the ITU, Australian, Richard E. Butler, recently addressed the Rotary Club of Sydney about the changing telecommunications environment in Asia and the Western Pacific. Since he kindly sent a copy of this address to the Editor it is assured no objections will be raised in quoting from it.

"A clearer recognition of the need for widespread international co-operation comes at a time when the world at large is also becoming more conscious of the importance of telecommunications of all kinds.

We recognise that telecommunications are part of the political system of society. As such they have a role to play in the furtherance of social, economic and other policy aspirations of direct concern to all.

The wide multilateral interest is now reflected in the participation entities and scientific and industrial organisations in the work of the ITU. For example, at the General Assembly of the 146 Member Governments, each with their independent rights and aspirations to be accommodated in the collective international will and processes of the Union.

An indication of the awareness of governments in Asia and the Western Pacific of the importance

of telecommunications can be obtained by examining the growth in the membership of the ITU.

Including only a few members from the region a hundred years ago (India, Iran, New Zealand and some Australian States) the number of members from Asia and the Western Pacific was still just 15 countries in 1950. But today, it is approaching 40.

In the last 25 years new nations started emerging as independent States acting for the first time sovereignly to meet their own requirements.

In many instances, these countries, some wealthy, some less so and some very poor, were unable to provide a communication infrastructure commensurate with even the most immediate economic and social requirements. Consequently it is logical therefore that the ITU... should set out to assist in meeting the needs of these countries, by providing field assistance as an Executive Agency for the United Nations Development Programme.

We are, in reality, developing master plans for the closer integration of Asia and the Western Pacific in the global telecommunications system, using a mixture of land and satellite systems. Land systems will provide connections from Asian countries to the Middle East and through the Middle East to Europe and Africa.

The ITU is an impressive and long-standing example of world-wide international co-operation in the development of telecommunication policies. It is the oldest of the inter-governmental organisations

which form the specialised agencies of the United Nations and traditionally its work has been of a standard setting and regulatory nature.

It provides the forum at various hierarchical levels for the telecommunication interests to decide on the long-term policy applications, to arrive at standards, eliminating inconsistencies in the arrangement and conduct of the services so that advanced technology can be effectively employed in telecommunications will be employed to the full.

Policies with regard to telecommunications, resulting in the adoption of regulations and recommendations to the realisation of development are, by and large, elaborated in the Union by persuasion and by consensus. The acceptance of such policies is strongly assisted by the fact that the people to whom they are directed have themselves contributed to their formulation. The opportunity that the Union provides for joint and voluntary consultation, in the widest sense, is the corner stone in its continued success.

The present state and future development of all telecommunications is undergoing rapid change and greater exchanges between governments, their authorities, specialists, etc., with the active participation of a well informed public assisting in the formulation of future policy measures, needs and investments inherent in their application. Future development is no longer only a question of providing a telegram or telephone service, or organising broadcasting and some fixed and mobile services using the radio frequency spectrum.

Some potential telecommunication applications create sensitive policy issues. These can only be satisfactorily resolved by multilateral considerations, understanding and mutual co-operation at the world, regional or inter-country levels — not merely between governments and their authorities but at all levels, including you and your individual counterparts — irrespective of your vocation".

The word "telecommunications" has a very wide meaning — see AR Jan. '76 p. 21.

On the WARC 79 front the Australian amateur service brief has taken shape and it is understood that the administration has now received the agenda for the Conference thus enabling the postponed meeting of the APG to take place early in October.

The Federal President was invited to attend the

50th anniversary celebrations of JARL in Tokyo later in September but unfortunately could not accept. Mr. Michael Owen, VK3KI however will be attending in his role as a Director of the IARU R3 organisation as well as representing the WIA. He will take with him from the WIA a suitably-prepared token in the shape of a slab of Australian raw opal cut to the outline of Australia with a silver plate to mark the gift.

A.O.C.P. EXAM PAPERS AUGUST 1976

POSTAL AND TELECOMMUNICATIONS DEPARTMENT AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY

SECTION K (Regulations) August 1976 POSTAL AND TELECOMMUNICATIONS DEPARTMENT

Time allowed — 30 minutes.

NOTE: Three questions only to be attempted. Credit will not be given more than three answers. All questions carry equal marks.

- (a) In your own words, state the method of determining the power output of a single sideband suppressed-carrier emission.
(b) What type of transmission is a:
(i) A3H emission.
(ii) A1 emission.
- (a) List the type of messages not permitted in the amateur service.
(b) Under what conditions may an unlicensed person be permitted to use the microphone of an amateur station transmitter?
- (a) Discuss briefly the regulatory requirements regarding portable and mobile operation.
(b) Give an example of a radiotelegraphy call and reply when VK2AA is calling VK3AB.
- Give the meaning of the following abbreviations:
QSV QSY QRZ? QSB? AA

AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY SECTION M (Theory) August 1976

Time Allowed — 2½ hours.

NOTE: Seven questions only to be attempted. Credit will not be given for more than seven answers. All questions carry equal marks.

- (a) Assisted by a block diagram, describe briefly the function of each stage of a single-sideband suppressed-carrier (A3J) transmitter.
(b) List three advantages to be gained by using the A3J mode of transmission in preference to double-sideband full-carrier (A3) transmission.
- (a) Assisted by a sketch, describe the construction and theory of operation of a crystal microphone.
(b) Listing component values, show by means of a circuit diagram how this type of microphone is connected to an amplifier.
- (a) Describe the manner by which high-frequency radio waves may be propagated over long distances. Explain why communication between countries such as America and Australia is restricted to certain times in the HF bands.
(b) Explain why communication over long distances as described in (a) is not possible using the VHF and UHF amateur bands.
- (a) A double conversion type super-heterodyne receiver is tuned to a signal on 14.1 MHz which is amplitude modulated by a 1000 Hertz tone. Draw a block schematic diagram of such a receiver and show typical frequencies present at the input and output of each stage.
(b) Discuss the theory of operation of this type of receiver and list any advantages and disadvantages it may have in comparison with the single conversion type.
- (a) Explain the fundamental difference between frequency modulation and amplitude modulation.
(b) With the aid of a circuit diagram, explain the theory of operation of the discriminator stage of a receiver suitable for reception of frequency modulated signals.
- Assisted by a circuit diagram, describe the operation of a mains operated power supply which uses silicon diodes. The power supply is required to provide a regulated output of 6 volts to supply a crystal oscillator and an unregulated output of 9 volts for the buffer stage of a transistor type transmitter.
- (a) With the assistance of plate current-grid voltage curves explain bias conditions for valves operating in Class A, Class B, and Class C amplifiers.
(b) Give an example of the use of each class of amplifier and indicate approximate efficiency percentage in each case.
- (a) What is meant by the following terms when used in reference to an iron cored transformer:—
(i) turns ratio; and
(ii) impedance ratio?
(b) List the losses associated with the operation of a power transformer and state how these may be minimised.
- Two resistors, R1 and R2, of 20,000 and 10,000 ohms respectively are connected in series across a 20 volt DC supply of negligible impedance. Calculate:
(i) the potential difference across each resistor;
(ii) the power dissipated by R2;
(iii) the voltage reading which will be obtained if a voltmeter having an internal resistance of 10,000 ohms is connected across R1.

BOOK REVIEW

VHF-UHF MANUAL An RSGB Publication

Well the British have done it again! This time they have produced not only an up-to-date manual on the practicalities of VHF and UHF operation, but also a reference book which is likely to stay in one piece for more than twelve months!

The third edition of the RSGB's VHF-UHF Manual is to hand and its 400 odd pages cover most of the main subjects that you would expect to find in this type of reference plus some bonuses. It is a hard-cover reference book and weighs a fraction over 1 kg.

The main chapters are Propagation, Tuned Circuits, Receivers, Transmitters, Filters, Aerials, Microwaves, Space Communication and Test Equipment — not very inspiring titles but the information contained within the chapters is vast.

The chapters on Receivers and Transmitters cover the field admirably with detail on the everyday modes of operation together with sufficient information on the more exotic modes (such as ATV) to whet the appetite of newcomer or oldtimer alike.

A new section on Microwaves is by far the best I have seen in any amateur publication. Information on Waveguides, aerials — design and construction Gunn oscillators etc. is such that surely an upsurge in microwave communication must result.

A chapter on Space communication covers the satellite and EME field well.

One or two little things which I like about this edition (bonuses) include the expanded information on design and the large number of "building block" circuits. For example the book contains numerous graphs, nomograms and design charts which are all relevant to its part of the spectrum, including a resonant frequency chart for 20 to 6000 MHz, a design chart for quarter wave helical resonators 1 to 10,000 MHz, coil design information 0.01 to 1 microhenry etc., etc.

On the "building block" side, there are many useful circuits, transistor RF amplifiers for 1296 MHz, linear amplifiers, high power amplifiers for 70 cm, wide band IF amplifiers for microwave work and so the list goes on.

Perhaps the notes on the fly leaf cover, fairly well sum up my thoughts on this publication.

"This manual deals with techniques and equipment applicable to frequencies above 30 MHz. It is in this part of the spectrum that much work is now concentrated with particular emphasis on microwaves. While the contents are primarily for the amateur technician there is much information of value to the professional engineer".

Oh!, and by the way, if you think you know all about the ins and outs of VHF propagation — What is a Skelton teletypegram? (it's got nothing to do with a skelton).

BOOK REVIEW

BIG EAR

A new very readable book just out is by the famous John Kraus, WJKB, who first conceived the "flat-top" beam named after his call-sign 40 years ago.

The book is somewhat, and interestingly, autobiographical leading from and up to discoveries by the Ohio State University radio telescope in some attempt to answer the question whether or not we are alone in the Universe. On the way he describes many meetings, amusing anecdotes and much about amateur radio and astronomy.

Published by Cygnus-Quasar Books of P.O. Box 85, Powell, Ohio, USA 43065 at US \$2.95 color price post paid. ■

INTRUDER WATCH

All Chandler, VK3LC

1526 High Street, Glen Iris, 3146

Intruder Watch Memo No. 2 1976 from the ARRL is worth quoting —

"Our new and intensified Intruder Watch program went into effect June 10, and already things are rolling. To this date, we have received affirmations from the FCC monitoring branch for five of the Broadcasting stations on our forty metre exclusive Amateur segment, and more are coming soon. Once the FCC treaty branch receives copies of the reports we have on file, diplomatic action will begin, taking the form of telegram to the offending administrations. We have also sent the FCC all our documentation concerning the FAA weather link spur on 14195 kHz. The FAA technicians are aware of the radiation but have not been successful in finding its cause. We will keep you informed of all 'IW developments'.

And further — "So far this year, we have received practically no reports of any intruders in the 160, 15 and 10 metre bands. We assume that the lack of intruders on these bands is due to the poor band conditions. But is this really the case? Could it be that the poor conditions have simply discouraged IWers from listening on these frequencies? In 1975, the World Administrative Radio Conference (WARC) will determine frequency allocations for the remainder of this century. Currently, 15 metres is being eyed on an international scale by shortwave broadcast services and 10 metres is becoming interesting to fixed service ionospheric scatter links (again on an international scope). Even domestic broadcasters are looking to expand their services up to 1805 kHz.

Without a source of objection to the presence of intruders on our shared bands (not simply the exclusive segments) we have no muscle with which to defend our rights to this spectrum space. Don't ignore 160, 15 and 10 — conditions will improve long before 1979.

"I would like to stress some points that were made about reporting methods. It would be of extreme help if any patterns of operation were reported. Does the station transmit only on week-days? Only at certain times of the day? Every day? Does the station announce that it is beaming its transmissions to a particular region of the globe? (This is important if the station announces that it is beaming to our region). If its mode is F1, what frequency shift is it using? Bandwidth? Most important of all: if you aren't sure of something, leave it blank rather than guessing at it or assuming it. Our IW reports are

written evidence, and it does absolutely no good to our cause for them to be inaccurate".

The sentiments expressed in that memo apply equally effectively to us in Region 3, and I would like to see more enthusiasm shown by members in reporting intruders.

We have had reports from time to time of Japanese fishing boats operating in Australian waters and I have been in touch with our Administration regarding these boats. When they operate between 3500 and 3700 kHz in Australian territorial waters they are intruders, but it has to be established that they are operating in our territorial waters less than 12 miles offshore. If it can be established that they are operating within these boundaries then they will send a complaint to the Japanese authorities. Thus, in reporting it will be necessary to get a fix on the boats, and also take a read out of their traffic. It must be known that they are Japanese, and not Taiwanese. ■

20 YEARS AGO

Ron Fisher, VK3OM

OCTOBER 1956

It is surprising that AR Editorials written around the late 1956 period that the Federal Executive were formulating plans for representation at the 1959 ITU Conference. October 1956 put the question 'To Represent or not to Represent' with several suggestions on just how we could be represented. Of course we were represented expertly by the late John Moyle. With WARC 1979 coming up, I hope present day amateurs are thinking along the same lines.

Hans Albrecht VK3AAH was a prolific contributor to Amateur Radio during the fifties concentrating on antennas and propagation. His 'Analysis of World-wide Ionospheric Propagation to and from Australia, 1953-1954' presented in the October 1956 issue was indeed a monumental effort.

Part two of Ian Barwick's Pulse Theory discussed multivibrators of various types.

Technical articles were rounded out with 'Understanding Telephony Interference' by Valance McCoy WIICP, a reprint from QST of April 1956 and 'Low-Pass Filter Home Building Simplified' by that other popular author Hans Ruckert, VK2AOU.

A note of interest was that Frank VK9FN picked up a distress signal from Danny WFL when his yacht developed engine trouble in wild seas south of New Guinea. Frank arranged for a launch to be sent to Danny's aid. ■

CONTESTS

Kevin Phillips, VK3AUQ

Box 67, East Melbourne, 3002

CONTEST CALENDAR

October

- 2/3 VK/ZL/Oceania Phone
- 9/10 VK/ZL/Oceania CW
- 16/17 Scouts Jamboree
- 15/17 RSGB 7 MHz CW
- 30/31 CQ WW DX Phone

November

- 6/7 RSGB 7 MHz Phone
- 27/28 CQ WW DX CW

December

- Dec. 11/Jan. 16 Ross Hull VHF Memorial

CQ WORLD WIDE DX CONTEST

Phone October 30-31 and CW on November 27-28 Starts 0000 GMT Sat. and ends 2400 GMT Sun.

All bands 1.8 to 28 MHz may be used, with Single Operator Single band and Multi band, Multi Operator (all band only) single transmitter and multi transmitter.

Exchange RS/RST report and zone, i.e. 5930, 58930. Each zone and country worked on each band counts as a multiplier. Contacts between stations on different continents count 3 points, and between stations in different countries, but the same continent are 1 point. Contacts between stations in the same country count only for zones and multiplier.

Final score is total QSO points by the sum of zones and countries worked.

Logs must have all times in GMT. Indicate zone and country, multiplier only first time it is worked on each band. Use a separate sheet for each band, with a summary sheet for each band.

Send logs postmarked no later than Dec. 1 for phone, and Jan. 15 for CW, to—

CQ WW Contest Committee
14 Vandewater Avenue,
Port Washington, L.I., N.Y., U.S.A. 11050.

I have received from Frank Anzalone W1WY a list of VK entrants in last year's CQ WW DX Contest.

PHONE

VK4UR	A	242,951	672	40	87
VK4FH	A	183,300	630	37	63
VK3MF	A	159,083	489	39	72
VK3ARY	A	123,541	355	43	78
VK3SM	A	42,016	141	35	66
VK2CW	A	24,024	106	33	55
VK3LU	A	18,222	101	24	39
VK3CQ	A	11,346	65	25	37
VK4UT	A	7,543	57	16	31
VK6CT	2F	468,309	1,427	29	82
VK4DD	14	18,428	104	24	44
VK5BS	14	3,900	38	13	26
VK5WO	14	2,352	30	11	17
VK4XL	7	22,412	153	20	32
VK3XB	3.5	8,379	145	10	11

CW

VK3MR	A	507,870	857	78	120
VK2GW	A	333,336	838	56	80
VK4FH	A	95,284	400	36	46
VK4UR	A	49,700	254	33	38
VK3XB	A	23,511	162	27	24
VK3LU	A	15,255	113	13	32
VK4UR	A	7,774	102	13	13
VK4XA	28	2,448	58	8	8
VK3RJ	21	7,107	107	13	10
VK6HD	14	469,320	1,325	32	88
VK5HP	14	24,376	188	19	25
VK3AFN	7	48,804	334	18	31
Max. op. single TX					
VK6DS		568,010	1,003	64	126

CONTEST CHAMPIONS TROPHY

It is too early yet to see who will get points for the trophy from the RD Contest, as logs are still coming in at the time of writing. I will take this opportunity to correct a mistake I made about the Trophy in July AR. The winner's name will not be engraved on the Trophy as it would be only a few years before there would be no room for further engraving. A list will be published each year of past winners of the trophy.

The next contest to count towards the trophy is the VK/ZL/Oceania Phone and CW. Best of luck to all participants. ■

AWARDS

COLUMN

Brian Austin, VK5CA

SSB AWARD — CZECHOSLOVAKIA

General:

- The award is available to licensed amateurs.
- Contacts on and after 1st January 1959 are valid.
- Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of a National Society.
- The award is issued for 2 x SSB contacts only.
- The fee for the award is 5 IRC.
- The address for applications is—
Central Radio Club
Awards Manager
Post Box 69
Prague 1, Czechoslovakia.

Requirements:

A total of 25 points is required from confirmed contacts with different stations in Czechoslovakia. Contacts on 3.5 and 7 MHz count 2 points each and those on 14, 21 and 28 MHz one point each.

CROSS COUNTRY AWARD — DENMARK

General:

- The award is available to licensed amateurs.
- Contacts on and after 1st April, 1970 are valid.
- Amateurs should submit a list certified by the Awards Manager of a National Society.

- The award is issued for either ALL CW or ALL PHONE.
- The fee for the award is 5 IRC.
- The address for applications is—
EDR Traffic Manager
Post Box 335
DK 9100 Aalborg, Denmark.

Rules: The call sign is the basis of the award. Each call area OZ1 to OZ9 and OX3 must be contacted. 3 contacts with each call area are permitted on each band with the exception of OX3 where 9 contacts are permitted on each band. Only OX3 cards are valid for Greenland, OX5 cards do not count.

Requirements — 40 points.

Communities List:

- Copenhagen Amt
- Frederiksborg Amt
- Roskilde Amt
- West Zealand Amt
- Sorstrom Amt
- Bornholm Amt
- Fyn Amt
- South Jutland Amt
- Ribe Amt
- Vejle Amt
- Ringkøbing Amt
- Arhus Amt
- Viborg Amt
- North Jutland Amt

QSP

SEANET CONVENTION 1976

A note from YBOACH advises that the 6th Seanet Convention will be held at the Kartika Plaza Hotel, Jalan Thamrin in the middle of Jakarta, Indonesia from 12th to 14th November. He advises that there will be a 50 per cent room rate discount for convention delegates, and special discounts will be available from certain offices of Garuda Airlines for parties travelling by that method to the Convention. For further details contact him at Jalan Tebet Utara Dalam No. 6, Jakarta, Indonesia. This Convention is being organised by a committee of ORARI, the Indonesian Amateur Radio Organisation.

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the contributor and does not necessarily coincide with that of the publishers.

POSTAL AND TELECOMMUNICATIONS DEPARTMENT

P.O. Box 5412CC, G.P.O., Melbourne, Vic. 3001.

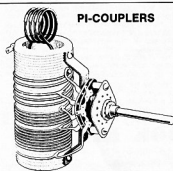
The Secretary,
Wireless Institute of Australia,
Post Office Box 150,
TOORAK, VIC. 3142
28th August, 1976

Dear Sir,

For your information and in the interest of your members, I wish to advise that Electronic Calculators are now permitted to be used at Novice Limited/Amateur Examinations under the following conditions:

- Calculators must be portable, silent, self-powered and able to be accommodated on a standard examination table. Programmed calculators are not permitted.
- Calculators must be switched off on entering the examination room.
- Candidates will be responsible for ensuring the proper functioning of their calculators prior to commencement of the examination. Power failure or other faults in a calculator provided by a candidate will not be accepted as a basis for special consideration in any examination.
- A candidate may not borrow a calculator from another candidate after entering the examination room.
- Examiners and supervisors have the right to inspect any calculators being used in an examination.

Yours faithfully,
J. W. Clayton, for Secretary.



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Suggested for use in "A LINEAR POWER AMPLIFIER FOR AUSTRALIAN CONDITIONS" (Refer "Amateur Radio", April, May & June issues, 1976).

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Western Zone Convention at Birchip, October 30/31.
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The Editor — Dear Sir,

A CO-ORDINATED AND UNIFORM APPROACH TO AMATEUR SLOW MORSE TRANSMISSIONS

It seems to me that the slow morse sessions are not co-ordinating properly hence duplication of effort occurs.

Having established a group to do the slow morse it seems that no recognised standard of morse is transmitted consistently.

I propose now to outline a method whereby the organisations involved do not duplicate the work of others and also that the standard of morse sent to prospective amateurs is uniform throughout and of a consistently high standard similar to that sent by the Postal and Telecommunications Department at exams. No doubt many will disagree with my proposed method. Perhaps you have a better method? If so, why not put it forward — there is always more than one way of doing a job.

CO-ORDINATION OF EFFORT

It seems to me to be a waste of effort to have stations in VK2, VK3 and VK5 sending slow morse at a variety of times independently of each other on a variety of frequencies. During the Autumn, Winter and Spring it would not seem unreasonable for the slow morse to originate from only one of these three States on any particular night — not all three as does happen. Static in Summer may mean that each State is required to transmit its own slow morse sessions during this season. I am unable to comment on the likely reception of these broadcasts in VK4, VK6, VK7 or VK8, although VK7 should receive these signals on 3550 kHz fairly well.

Transmissions emanating from any one of the following States — Victoria, New South Wales, Tasmania or South Australia — will be heard in the remainder of the country. This, of course, restricts slow morse transmissions could be shared e.g. VK2 conduct Monday and Tuesday night sessions, VK3 Wednesday and Thursday nights, VK5 Friday and Saturday nights and VK7 Sunday nights. Probably each night's morse would be of an hour's duration with two runs of morse going between 12 wpm and 12 to 16 wpm. With two runs it would mean that those who could not listen in at the end or beginning and can only spare about half an hour, will get a complete run at all speeds.

It can easily be seen that each individual running a slow morse session would have less work to do. If 4 amateurs are available for each night each amateur would only be required to send slow morse once every 4 weeks or about 13 times a year. A total of 28 amateurs would be required.

A UNIFORM STANDARD OF MORSE CODE

The standard of morse sent at the moment varies. It should be the aim of the slow morse operators to have a uniformly good standard of sending. To do this, it seems that one of the operators must scribe badly after sending a batch of morse at slow speed, particularly if it is all hand sent.

There are much easier ways of doing slow morse.

One method involves having several pre-recorded tapes of slow morse sessions. By having 3 one hour tapes it would mean that every 3 months the slow morse transmissions would be repeated. Some may say that this would mean that people would become familiar with the texts used. However, this is not so, as people are not likely to remember a text sent infrequently. After a period of 6 months to a year a morse student should have passed the 10 wpm morse code exam.

On the HF bands it is not permissible to send MCW and the morse tape is fed into a device which opens and closes a relay in response to the audio tones on the morse code tape. The relay would have the transmitter. The morse tape would have call signs placed on it at the appropriate intervals so that once the tape was started and the transmitter keyed by the audio keyer, the device would be observed the operator could do some reading, work on some project, etc.

The remaining problem is in the making of the tapes. The morse for the tapes could be provided by an electronic keyer or a keyboard type electronic keyer, perhaps used by a typist who has no knowledge of morse. The call signs on the tapes would need to be changed if the operators changed.

MISCELLANEOUS REQUIREMENTS

The most suitable band to send slow morse appears to be 80 metres. The static in Summer does make this band a bit of a doubtful quantity but overall it gives the best coverage in the evening hours over a range of probably 500 to 1500 kilometres. Some seem to think that slow morse transmissions should be on 15 metres. Much of this equipment used on this band is purely AM. Any would-be Amateur would be much better advised to get a receiver capable of tuning to 80 metres.

SUMMARY

1. There is duplication of effort by several groups to run the slow morse sessions.
2. By co-operation between groups it is possible to co-ordinate the slow morse transmissions so that each person has less work to do.
3. The standard of the morse is quite variable due to individual persons interpreting what is good morse code in different ways. The morse sent by some is not good, others excellent.
4. It is difficult for an operator to send uniform speed morse, with good formation and few mistakes with a hand key. It is suggested that at the very least an electronic key be used. However, it should be noted that no operator should use an electronic key until quite proficient with a hand key.
5. It is suggested that a bank of morse tapes be made up and distributed to all operators, and that these be used via an audio keyer (subject of a separate article) to key the transmitter and send out the slow morse.
6. Approximately 3 hours of tapes would be needed by each operator and these would repeat after every 3 months. Once made up the tapes should not need to be re-made for several years, hence saving a considerable amount of operator time and the strain of sending morse by hand.
7. The slow morse transmissions should run for about 1 hour per night on 80 metres. Other bands are not really suited for this purpose.
8. This system as proposed in principle may also suit VK5, VK4 and VK8, although time differences and physical distances would cause the system to be altered in some details.
9. More publicity needs to be given to the existing slow morse broadcasts so that people do know when and where to tune to receive them. Amateurs not involved in the slow morse would know to keep at least 5 kHz away from the slow morse transmission frequency. Not all would-be amateurs have super-selective receivers.
10. It is willing to be involved in co-ordinated and uniform high standard slow morse broadcasts.
11. Does anyone else have ideas on how the slow morse should be run? Why not write to the editor with your ideas.

Please do not think that I am not appreciative of the work that has been done, but I can see ways of making these transmissions more effective, less time consuming and less work for each person involved.

R. Champness VK3JUG,

44 Rathmullen Road, Boronia, 3155.

(This letter has been condensed to allow publication. — Ed.)

The Editor,

Dear Sir,

I have just received the results of my February AOLCP exam and learned of a pass.

I would like to thank the following stations and the owners for the invaluable service they performed in my study session.

"VK3ANJ", 3AZM, 3WS, 3WL, 3TK, 3VZ, 3ZGN, 3ZPG, and an old, old friend, Y8KJM (3YCK).

Bruce, L-30578 VK3-777.

QSP

MORSE CODE EXAMS

"Written CW tests are likely to be with us for some time to come despite the recent relaxation of the rules to permit code 'comprehension' exams. The new procedures still haven't been framed up, and even after they are it will take a while before new tapes and standard examination material can be produced and distributed. The change should take place some time this year, though — late — all seems likely". Ham Radio, June '76.

PROJECT AUSTRALIS

David Hull, VK3ZDH

NOVEMBER 76

OSCAR 6

OSCAR 7

Date	Orbit	Time	Long	Date	Orbit	Time	Long
"W"	"W"	"W"	"W"	"W"	"W"	"W"	"W"
1	18500	01:08	74.75	1	8974	00:16	53.89
2	18512	00:08	59.75	2	8987	01:10	67.51
3	18525	01:03	73.50	3	8999	00:09	52.38
4	18537	00:03	58.50	4	9012	01:03	66.01
5	18550	00:57	72.25	5	9024	00:03	50.88
6	18563	01:52	86.00	6	9037	00:57	64.51
7	18575	00:52	71.00	7	9050	01:51	78.13
8	18588	01:47	84.75	8	9062	00:51	63.01
9	18600	00:47	69.75	9	9075	01:45	76.63
10	18613	01:42	83.50	10	9087	00:40	44.51
11	18625	00:42	68.50	11	9100	01:38	75.13
12	18638	01:37	82.25	12	9112	00:38	60.01
13	18650	00:37	67.25	13	9125	01:32	73.63
14	18663	01:32	81.00	14	9137	00:31	58.51
15	18675	00:32	66.00	15	9150	01:26	72.13
16	18688	01:27	79.75	16	9162	00:25	57.01
17	18700	00:27	64.75	17	9175	01:19	70.63
18	18713	01:22	78.50	18	9187	00:19	55.51
19	18725	00:21	63.50	19	9200	01:13	69.13
20	18738	01:16	77.25	20	9212	00:12	54.01
21	18750	00:16	62.25	21	9225	01:08	67.63
22	18763	01:11	76.00	22	9237	00:06	52.51
23	18775	00:11	61.00	23	9250	01:00	56.13
24	18788	00:08	74.75	24	9263	01:54	79.75
25	18800	00:08	59.75	25	9275	00:54	64.63
26	18813	01:01	73.50	26	9288	01:48	78.25
27	18825	00:01	58.50	27	9300	00:47	63.13
28	18838	00:56	72.25	28	9313	01:42	76.75
29	18851	01:51	86.00	29	9325	00:41	61.63
30	18863	00:51	71.00	30	9338	01:35	75.25

LARA

Ladies Amateur Radio Association



Standing (l. to r.): Gladys VF/VK3YS, Mavis VF/VK3ER, Norma VK3JVL, Austine VK3YL, Mavis VK3BS; seated (l. to r.): Kate, Heather VF/VK3ZEB, Irene VF/VK3YER.

Last month, LARA's Great Event was duly celebrated but the pictorial evidence didn't quite make the publication date. However, this omission has been rectified and we present a view of celebrating LARA members in their natural habitats. Thanks go to Mavis VK3KS for her hospitality at the VK3 August meeting.

We now present the topic of the month — "How to Dry the Washing Indoors Without It Dropping All Over the House".

These are the views of an impartial observer of the joys and difficulties of running a YL/OM station. A short quiz of persons in this situation reveals that solutions to this problem vary. One group favour the "separate shacks at the opposite ends of the garden" theory, while another group favour the single (crowded) shack with his and hers mess. Members of this group do in fact concede that the M/F/S ratio (i.e. the ratio of mess to cleared floor space) is proportional to the square of the number of people using the shack, multiplied by complicating factors such as Q (number of 240V outlets square metres [sewing machine interference] and LM — [who left the lawn mower there for me to trip over]).

LARA proudly announces the result of extensive research as M/F/S . . .

MAGPUBS

Members interested in overseas publications should please note constant changes in prices which are of course also affected by exchange rates. Overseas magazines are always posted direct to you from suppliers, so please allow about 3 months for transit delays.

The latest subscription list is —

	1 year	2 years	3 years
QST (ARRL)	8.50	17.00	25.50
Radio Communications (RQB)*	11.75	—	—
Break-in (NZART)	5.20	—	—
Ham Mar	7.75	—	17.00
CQ	6.50	11.00	—
CO-TV (UK)*	4.50	—	—
VHF	8.00	—	16.50
VHF Communications	5.00	sea mail	—
(quarterly)	7.00	air mail	—

*Please ask for membership form beforehand.

- **BACK ISSUES** of VHF Communications are normally available from stock except 1969 issues which are out of print. Single copies are \$1.10 each to 1974 and \$1.40 each from 1975 (average weight of each is 50g); VHF Communications binders to take 12 issues are \$2.25 each and weigh 250g.
- **BACK ISSUES** of other magazines are not available but sometimes can be obtained against special order.
- **BACK ISSUES** of Amateur Radio are available to members. Some issues are out of print however. Issues March to May 1972 at 30c each, June '73 to Dec '74 at 40c each, Jan-Oct '74 at 50c each, Nov 74-Aug '75 at 70c each, Sept '75 onwards at 90c each. Calculate average weight as 120g per issue.
- **AMATEUR RADIO** is available on overseas subscription at \$10.00 for 1977. It is also available at this rate for libraries and organisations such as Government Departments, Schools, etc. All these are post paid by surface mail.
- For overseas subscriptions, please enquire about extra cost for air mail. As an indication of rates — extra for Air Mail to PNG is \$10.00 for a full year.
- **YRCS NOTES** are also available on request.
- Recruiting leaflets "8000" are supplied free of charge.
- **OTHER ITEMS** are also normally available from stock. These include —
 - Membership Badges (specify full or associate, lapel or stick-pin) \$1.50*
 - Terylene ties, blue or maroon \$2.90*
 - WIA Project Australis Great Circle Maps (on Melbourne) \$1.00*
 - Overseas DX & USA Call Books, NZART Call Books, and many, many other interesting items — please send for lists.

*Post Paid.

Except for magazine subscriptions all other items are normally available from YOUR DIVISION. To save on postage and packing, it is better to enquire there first if you live in capital cities.

WHAT BETTER PRESENT COULD THERE BE FOR CHRISTMAS AND NEW YEAR THAN A MAGAZINE SUBSCRIPTION OR GOOD BOOK.

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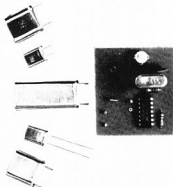
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Application	NBFM	NBFM	WBFM	WBFM	WBFM	NBFM	NBFM
Number of Filter Crystals	8	8	8	8	8	4	2
Bandwidth	12.0 kHz	15.0 kHz	30.0 kHz	36.0 kHz	40.0 kHz	14.0 kHz	14.0 kHz
Pass Band Ripple	< 2 dB				< 1 dB		
Insertion Loss	< 3.5 dB	< 4.5 dB	< 4.5 dB	< 4.5 dB	< 3 dB	< 1.5 dB	< 1.5 dB
Input Output	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω	7500 Ω
Termination	25 pF	25 pF	25 pF	25 pF	25 pF	25 pF	—
Shape Factor	170 dB/2.4	170 dB/2.3	170 dB/2.2	170 dB/1.9	170 dB/2.0	40 dB/3.0	120 dB/3.6
	190 dB/2.8	190 dB/2.9	190 dB/2.7	190 dB/2.5	190 dB/2.5	—	130 dB/5.7
Ultimate Attenuation	> 90 dB				> 60 dB	> 30 dB	> 30 dB
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	Mounting Hardware Included				Can	can	—
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IONOSPHERIC PREDICTIONS

Len Poynter, VK3ZGP

My references to the Solar Flux predictions in last month's AR were premature to say the least. The latest issue from CGIR along with suitable warnings about use of the figures in the transition period between Cycle 20 and 21, has reduced the Solar Flux predictions by some 30 over the following 12 months.

Latest monthly sunspot means have shown just how quiet the sun has been. The following monthly means and the last figure in brackets gives the number of days without visible spots, 1/76 = 8.5 (15), 2/76 = 4.6 (17), 3/76 = 23 (5), 4/76 = 19 (2), 5/76 = 12.7 (6), 6/76 = 12.4 (7), 7/76 = 2.1 (24). I think most will agree July was quiet.

However, early in August a sizeable spot from Cycle 21 was in evidence for around 14 days before it disappeared around the western rim. Bert VK3GS has a photograph to show it amongst some weak Cycle 20 spots.

The smoothed number has been varying again 7/75 = 15, 8/75 = 14.3, 9/75 = 14.5, 10/75 = 15.6, 11/75 = 16.4, 12/75 = 16.8, 1/76 = 15.5 with predicted smoothed numbers for the remainder of the year as 10/76 = 5, 11/76 = 4, 12/76 = 3, 1/77 = 3.

One interesting factor of late is the decline of geomagnetic storms. The last noted on June 11, lasted only 21 hours. The worst disturbances now only reaching the unsettled area and not lasting long. This appears to be customary for the time of the cycle.

My own charts of geomagnetic activity show a general "quietening down", with the A index reaching 33 on June 11, but being predominantly below 20, with lows around 2-10 for long periods. If only there was some good solar activity to brighten up the scene.

From predictions, the experts would have us believe that the coming cycle is not likely to top 50 in the running smoothed numbers. This would resemble the 72-73 period. Not too bad for 80, 40, 20 not so good for 15 and just an occasional stirring from 10 m. Guess we will have to wait and see.

LARA (continued)

$$\frac{(Nyl + Nom)^2}{\sigma^2 240} + \frac{(SM - LM)^2 \times 1^*}{OM}$$

*This factor optional depending on whether or not you can put one over the OM.

Exponents of the two-track theory tend to emphasise the bliss and peace of mind of being able to find anything just where you put it down last time (even if it was dropped down behind the base station at least you know where it is!). Those who go to the extreme of having two towers in the back and/or front gardens, discover an extra clothesline for the asking. And on wet, rainy days you have two indoor refuges to dry the sheets suspended neatly from the cox. (N.B.: Some OM's disagree violently with this last simple household hint, so be warned!)

In conclusion we point out that as in most amateur shacks — anything goes (except of course the particular rig one wishes to operate at that particular time).

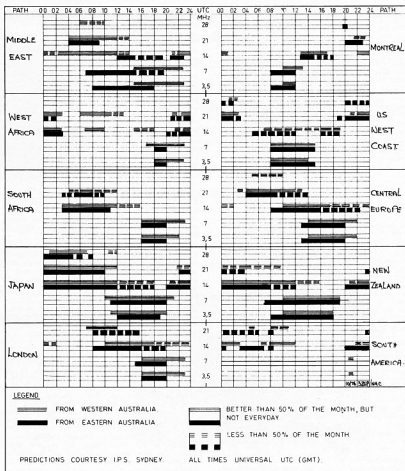
QSP

MOONBOUNCE

"We are always happy to have visitors come along to Moonbounce tests at Dapto, but it is a big help if they make sure that they arrive before tests start — or do the last couple of hundred yards last foot, as our receiving system is very sensitive to auto ignition noise". Aug. 76 Moonbounce Report by VK2ALU in "The Propagator".

PROVOCATION OF THE MONTH

Please advise the discount for licensed amateur's subscriptions to the WIA.



19th JOTA

A reminder about the Jamboree on the Air. Noel Lynch, VK4ZNI, the National organiser advises that the official opening address will be broadcast live at 10.00 h EAST on Saturday, 16th October by H.E. the Governor-General and Chief Scout of Australia, Sir John Kerr. Frequencies will be 7070 and 14170 kHz ± GRM.

SHREWDIE ON SUBS

News from Newcastle is that several members each pay a small monthly instalment into a local Building Society so that at the end of the year a covering cheque is sent off to the Executive Office along with the subscription notices. The interest goes towards the local Branch. They will be doing the same thing for their licence fees at \$1 per month.

INTERFERENCE ON SHARED VHF/UHF BANDS

It is possible, states the chairman of the VHF/UHF Advisory Committee, for secondary services to cause interference to primary services particularly in the 23 cm band. Such interference is likely only if wide band transmissions are employed, such as A5 (video). It is unlikely that narrow band (phone) emissions would cause interference. Clarification is being sought on this matter with the Department.

RTTY VDU

Norm Wilson VK4NP writes that he has prepared an information package on the construction of a RTTY VDU, and limited quantities are available from him for anyone wishing to construct such a device. The cost is \$5.00 inclusive of surface mail postage. His address is QTHR.

DYNAMIC MICROPHONES

"Not too well known among amateurs is the fact that dynamic microphones exhibit a proximity effect which increases the bass output as the distance between the source of sound and the microphone is decreased . . . for best results speak directly into the front of the microphone, but keep it at least 4 inches (10 cm) away from your mouth". Ham Radio June '76.

HAMADS

- Eight lines free to all WIA members. \$9 per 3 cm for non-members.
- Copy in typescript please or in black letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

3 Mono Band Yagi Beams 10, 15, 20, \$100. Now dismantled and on ground. VK3BW Portarlington. Ph. (052) 59 2322.

Linear Amplifier, 2 x 813 60, 40, 20, 15, with extra switch position for desired band of your choice. 2 spare tubes, heavy PSU. Table top RF unit, needs a little tidying up, excellent performer, buyer to collect, \$140. B. Bathols VK3UV, QTHR. Ph. (03) 90 6424 A.H.

HAMADS (continued)

"Ham-Cat" base whip with 80 metre, 40 metre and 20 metre coils and whips. \$502 per set. Harry Michael VK3AS1, QTHR, Ph. (052) 21 6244 Bus., or (052) 43 1283 A.H.

Xtals for Europe and G. 2 m FM channels, to suit Icom IC22A transceiver, 9 repeater and 3 simplex channels. \$75. VK2SM, QTHR, Ph. (02) 523 1232.

Kenwood TS520, as new \$475, Multi-VHF transceiver complete with all xtals \$220. Swan 350 transceiver \$250. TH60XX Antenna, as new \$160. Heath HW101 Rotator, as new \$120. Tower 35 ft. fly-wind-up, in good condition \$50. Antenna, Rotator and Tower as package deal for \$300. Must sell, deceased estate. All offers to VK3AGS, QTHR.

Heath HW101 CW/SSB receiver 2 x 6146 3.5-30 MHz, similar to that with VQ2QL, complete with hand mic., unused Mullin fan, speaker in case, new Archer headset, 240V P/S, handbooks, filter, 100 kHz CW filter, PEP 180 W. Only defect is erratic 5 meter circuit. \$375 plus freight. Hansen TV spec. ckt. tester \$15. Hand and 2 bug keys, best offers, Hansen FS meter type FS1, best offer, National HRO RX, 9 coils LF and HF band spread and general coverage, P/S and speaker, best offer. Paec VCT with capacitor panel, best offer. Deceased estate. VK2QZ, QTHR, Ph. (02) 76 6861.

AT21 Tx with P/S, best offer and purchaser to arrange collection due to weight. ATR28 with P/S. Operates 3.5 and 7 MHz, best offer. Paec all wave osc. signal generator, best offer. 14 AVQ vertical, needs some repairs, installation sheet with antenna, \$20. Deceased estate VK2VB, Mrs. Lewis, 13 Junction Ave., Ryde, N.S.W., 2140. Ph. (02) 80 1357 weekdays only.

Oskar SWR and power meter, as new \$45. Ph. (02) 476 5096 after October 2. VK2BEK, own QTH 8/66-68 Florence St., Hornsby, N.S.W., 2077. Ph. (02) 476 5096 after second October.

Trio Twins, TX599-JR598 in perfect condition, \$600 o.n.o., two 8-pole SSB filters, 1.4 MHz \$45 or \$25 each. VK2WR, Ph. (02) 869 8863.

Vinten BTR10 base with VK3 pre-amp, coax switch, PIT mic., spare tubes, xtals for 2 Rx, 4 Rx, 40 Rx. Handbook, excellent condition. Discote Antenna R. April 73 30 foot mast with nylon guys, 7T buckles, approx. \$50. UR67 coax, ARRL UHF Manual, \$160 o.n.o., will separate. Philips HF OSC GM2893, \$35. Amateur Band Rx 80 m-10 m, \$100 o.n.o. Tony Hambling 130377, 98 Bayview St., Williamstown, 3016. Ph. (03) 397 6773.

High-Gain aluminium commercial Quad, 42 lbs. plus heavy duty rotator, 145 lbs., 100 ft. of coax and 7 strand control cable, 25 ft. tilt-throw tower, 100 SWR 10, 15 and 20 metres, sale working. Genuine snp \$200 or will sell separately. VK2AXZ Newcastle, Ph. (049) 54 0893.

Swan 350 with pbx/speaker, handbook, \$225. VK2SL, 12 Russell Ave., Warners Bay, 2282.

Robot SBTV Monitor, model 70A, new, \$300. VK3VF, QTHR, Ph. (03) 723 3554.

Yth-Hin Th-4 tri-band beam, full size, four element antenna for 10, 15 and 20 m. Discontinued, with instructions, \$100 o.n.o. VK2AKR, QTHR, Ph. (02) 81 4659.

Uniden 2920 and external VFO in mint condition with handbook, microphone and cables in original boxes. \$510 plus GST. VK3AYK, 1 Elster Ave., Gardenvale, 3185. Ph. (03) 96 2412.

KVG EX-8A crystal filter (transmit) with carrier eters, new, unused, \$30 o.n.o. P. Birrell, VK3ZTT, Box 261, Mt. Gambier, 5290.

Heathkit SB401/301 80-10 Mx Transceiver, plus SB610 Monitorscope and SB900 matching ext. speaker. USB, LSB, CW and RTTY modes available. All bands. All units in good condition, no mods., to be sold as one unit complete with manuals. \$475 o.n.o. or would be prepared to discuss a swap with a solid state AC/DC Transceiver, VK2BIP, 3 Whitehead St., Khamocro, Ph. (050) 76 9338.

FT501 and FP501, \$650; FT401B, \$460; SP401 speaker and phone patch, \$90; FL2000B in amp., \$360; Y0100 monitor scope, \$150; FLOP LP filters, 2 only, each \$20; \$550; Hygain wall mounter and 6 post coax SW, \$50; 204 BA 4EL 20 m beam, \$190; 10/15 DB 3EL 10/15 m beam, \$100; Baluns, 2 only, each \$15, or above as complete station, \$1800. All under 6 months old. VK1CO, QTHR, Ph. (062) 88 5049.

FLDX 2000 linear, new 6KD6's, G.C., \$225 o.n.o. FRDX400, fully equipped 160-2 m CW, SSB, AM wide, AM narrow, FM, 11 metres, FM discrim., 6 and 2 m S/S converters, very clean, \$300 o.n.o. FR50B, very recent 80-10 metre ham band receiver, AM, SSB, CW, very clean, very sensitive, Hokusai mechanical filter, matching speaker, \$200 o.n.o. FTV502, brand new in box, \$150. Marconi UHF wavemeter 30-300 MHz, accurate and sensitive, \$50. Dummy Load, 75 ohm 1000 watt continuous, air cooled, good to 52 MHz \$25. Lots more stuff! VK3BIZ, Ph. (03) 88 1110 A.H.

Yaesu FT701 transceiver, recently overhauled, mint condition, \$350. VK2AQW, QTHR, Ph. (02) 449 3538.

2 — McLeod ME58/11A 10 W AM Transceivers, suit 80 m novice operator, complete with circuits and some tentative conversion information, \$15 each, no PSU. VK3UG, QTHR, Ph. (03) 231 2028.

Clegg FM27B 145-148 MHz transceiver, with additional 145 to 148 MHz segment and 6A regulated power supply, mint condition, \$245. VK2WD, QTHR, Ph. (02) 42 6080.

3 EI 6 m Yagi, 6 m Transverter, HB and all valve, 6/40 final, 21 MHz SSB input, works OK, available to most transceivers, \$50 o.n.o. The above requires personal collection. Vinten base mic., \$3. VK3ACM, Ph. (057) 58 2260 A.H.

Aciltron SSB 400 Transceiver, 400 W PEP output 160 m-10 m, very little used, as new, complete station comprising ext. VFO, AC power supply and speaker mike, transmitter test set (comprising 5 position ant switch, SWR bridge, 2 tone test), handbook and circuits. Cost \$1300 new, sell for \$650 o.n.o. VK7MS, QTHR, Ph. (004) 27 2117.

Yaesu FT200 and FP200 PSU, complete with mic., manuals etc., approx. 4 years old and in original condition, no mods., no marks, \$325 o.n.o. VK3BEA, 4 Alisa St., Dandenong Nth, or Bob Pallett, Ph. (03) 560 8222 Bus.

FT101 incl. 160 m, cooling fan, mobile mount, mic., all cables and manual, very little use, \$370; IC222 fitted with RT-7, reverse 1-7 simplex 37, 40, 43, 49, 60, 51, with mount, cables, mic. and manual; \$200; IC60 6 m FM mobile similar to IC222, fitted with 52.525 and 52.656, with mount, cables, mic. and manual; \$90; IC202 fitted with Oscar crystal and with 100 m watt PA, very little use, supplied with mobile cables, etc., \$190; GM 70 PA 2 m FM or SSB 10 W, 70 W out, solid state, \$50; Set HF mobile whip antenna, 10 m, 100 m, 100 m, 20 m, 11 m, 10 m, 6 m, 2 m, \$50 the set, Ray Roche, VK3ZRG/1, C/o Officers Mess, RAAF Base, Fairbairn, ACT.

Philips HF oscillator type GM2893 400 kHz-30 MHz, \$35; SWL amateur band Rx (homebrew) xtal-con. controlled converter, 3.5 MHz tunable IF, AM, SSB "S" meter 80 m-10 m, housed in very neat cabinet, \$110 o.n.o.; 60 copies past AR to (75), \$10; 24 copies past EA to (75), \$5; 36 copies past CO's (69-71), \$5, all in exc. cond. T. Hambling, 98 Bayview St., Williamstown, 3016. Ph. (03) 397 6773.

FT200 Transceiver, as new CW, HB AC power supply, Heathkit DC supply, Webster bandpass ant., lot #420. VK3XZ, QTHR, Ph. (051) 74 1144.

Digital Frequency Counter, 6 digit LED display, new, professional appearance, 400 kHz-250 MHz in two ranges, \$175. VK3XZ, QTHR, Ph. (051) 74 1144.

Yaesu FTDX500 transceiver 160 m-10, \$375; Gileso G207 Rx 80 m-10 m, \$30; TACO 1377 transceiver, 2 m, chs. R2, R5, R8, 40, 50, 25, \$75; 6 m transverters H/B, Rx ZXMPT121, PA 6/40, 40A, VK2ADY, QTHR, Ph. (067) 65 8664.

3 — CRO home brew, \$60; "Simple Sixer" 6 m Tx 100 W IP, CW, PS, \$55; Surplus BC242 VHF Rx chassis, CW, full instructions for conversion to 2 m, \$15. VK3ZFO, QTHR, Ph. (03) 718 2364.

Hy-Gain 204BA 4 el. 14 MHz monoband Yagi antennas, brand new in unopened factory cartons, two only \$160 each; Ham II brand new heavy duty antenna rotator with 100 foot Belden rotator cable in factory carton, \$150; Swan power supply, heavy duty, for Swan SS-200A broadband transceiver or Atlas requiring 12 volt at 10 amp. current level, good communications speaker built in. Model PS-20 240 V AC, new, \$150; Hy-Gain 18 AVT trapped vertical antennas with radials, two only, used 3 months, \$45 each. All prices firm. VK2JO James, Ph. (02) 36 2981.

SILENT KEYS

It is with deep regret that we record the passing of —

JOHN WILLIAM MARTIN VK3JW
John spent his early years as an engineer in the Commonwealth Aircraft Corporation.

After war was declared he served with the 8th Div. in Malaya. He was one of 25 men who survived from the 4th reserve MT Unit. Unfortunately he suffered a permanent disability which necessitated a long convalescence in the RGH at Heidelberg. When discharged in 1943 he took up the position of Chief Production Engineer at the aircraft factory in Highett. His health forced him into semi-retirement and he moved to Payneville where he operated the telephone exchange and the Post Office. It was during this time he became interested in amateur radio. He retired to Balnardsale and took out his amateur licence.

DX was his main interest and he became the control station of the Pacific DX net. He was a member of the Willis Island DX pedition in 1971.

He felt he had something more to give to amateur radio and in 1972, with the support of the Brisbane DX Club, he led the first Australian DXpedition to Mellish Reef. The call sign VK3JW became quickly known world-wide as it added a new country to the ARRL DX listings.

In 1974 whilst visiting the USA he was named as DX'er of the Year at the annual convention of the Northern and Southern California DX clubs.

John passed away on 22nd August, 1976 and will be sadly missed by his many amateur friends throughout the world.

VK4XY

T. W. A. HALLEY VK4TI (ex-VK3BX)
All will be remembered mostly by his many Victorian friends when he operated as VK3BX, Bentleigh, from 1932 to 1952. During World War Two AH was a Senior Inspector for the Army and it was his responsibility to accept Radio and Radar equipment on their behalf.

After the war, AH resumed his business as Master Builder and in 1957 retired to the Gold Coast of Queensland, where he operated from Chevron Island, Surfers Paradise, as VK4TI. AH was a proficient CW operator and enjoyed this mode very much.

We offer our sincere sympathy to his wife, Emily, and his sons, Marshall and Neville. VK4RF

WANTED

Valve Tester, complete with manuals covering modern USA valves, in excellent condition. Prefer transconductance meter, otherwise simple emission tester acceptable, price and details to H. T. Mulder, VK6MK, QTHR, Ph. (098) 44 1169.

Schematic and xtal. data on EX-AIF, RAAF portable XCV, used on 50 MHz band. Manufactured by Rogers Majestic in Canada, last used by military circa 1965. Will duplicate and return originals VK2VE, QTHR, Ph. (02) 665 9206.

Webster Bandpasser and base, particulars to VK6DC, QTHR.

Sell supporting tower, 30 to 40 ft. Contact J. Cordingley, 41 Jillicio Ave., Tallangatta, 3700. Ph. Tallangatta 295.

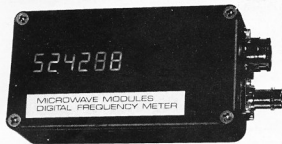
Yaesu FT701B, must be in good condition, with handbook, VK7EM, QTHR, Ph. (004) 37 2582 Bus. (004) 31 4908.

EXCHANGE

Radio Communication April 1976, plus Jan./Feb./ March 1976 QST for copy of Feb. 1966, April and May 1972 QST or sell. D. McConnell, 322 Ligar St., Balaarat, 3350.

50 MHz DIGITAL FREQUENCY METER and 500 MHz PRESCALER

from Microwave Modules, U.K.



MULTIPLEXED 6 DIGIT LED DISPLAY, CONSTANTLY UPDATED FOR CONTINUOUS FLICKER FREE DISPLAY FOR A CONSTANT FREQUENCY READING.

*Digit height 10 mm *Display width 45 mm *Case size 111 x 60 x 27 mm *Frequency range 0.45 to 50 MHz *Sensitivity, better than 50 mV RMS over above range *Input connector 50 ohm BNC *Input Impedance 200 ohm approx. *Power Connector 5 pin 270° locking DIN socket (plug supplied) *Power requirements 11-15 volts DC at 200 mA approx.

MODEL MMD050. Price \$115 add pack and post \$1

500 MHz PRESCALER

THIS PRESCALER USES HIGH SPEED ECL TECHNOLOGY TO ACHIEVE $\times 10$ OPERATION TO A FREQUENCY OF 500 MHz.

*Case size 111 x 60 x 27 mm *Frequency range 50-500 MHz *Sensitivity, better than 200 mV RMS over above range *Input Impedance 50 ohm, BNC connector *Power requirements 11-15 volt DC at 100 mA approx.

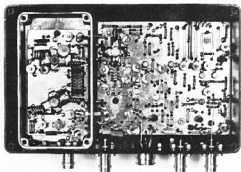
MODEL MMD500P. Price \$48.50 add pack and post \$1

432 TRANSVERTER Model MMT432

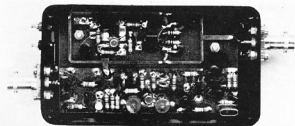
FEATURING COMBINATION OF A LOW-NOISE RECEIVE CONVERTER AND A LOW-DISTORTION TRANSMIT CONVERTER PRODUCING A SPURIOUS-FREE LINEAR SSB SIGNAL, PARTICULARLY WHERE HIGH STABILITY AND SENSITIVITY ARE OF IMPORTANCE.

Power Output 10 watts minimum *28 MHz IF *Drive 1 mW to 500 mW *Aerial Changeover by PIN diode switch *Modern Microstrip Techniques *Power requirements 12 volt nominal at 150 mA 1.5 amp. peak *Case size 187 x 120 x 53 mm *Spare 432 input socket.

MODEL MMT432. Price \$195 add pack and post \$2.



MMT432 Transverter



1296 MHz Converter

All modules are enclosed in black cast-aluminium cases of 13 cm by 6 cm by 3 cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via OSCAR 7 or for normal VHF/UHF communications.

NEW RELEASE — 144 MHz TRANSCEIVER MODEL MMT144/28 — This 144 MHz Solid State Linear Transceiver is intended for use with 28 MHz transceiver to produce a highly reliable transceive capability for satellite or terrestrial communication. — Power output 10W min. — 28 MHz drive — IF at 500 mW or 5 mW — Receiver gain and noise, typical 30 dB and 2.5 dB — Internal Antenna changeover — Case size 187 x 120 x 53 mm — Power requirements 11 to 13V at 300 mA to 2.2 amp. peak — Spare 144 MHz input socket.

Model MMT144/28 — Price \$165, Pack and Post \$2.

Australian Distributors for Microwave Modules Limited:

AMATEUR ELECTRONIC IMPORTS

P.O. BOX 160, KOGARAH 2217, N.S.W.

PHONE: (02) 547 1467

MAIL ENQUIRIES PLEASE ENCLOSE S.A.E.

The W.A. BULLETIN

WEST AUSTRALIAN SUPPLEMENT TO " AMATEUR RADIO "

OCTOBER 1976.

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All material for inclusion in the Bulletin to reach the Editors by phone, on air, or to:- 22 Salisbury St., Leederville.W.A. 6007. - - - before the 10th of each month.

CORRESPONDENCE. All other correspondence should be addressed to :-

Hon. Secretary,
W.I.A. (W.A. DIVISION).
P.O. BOX N1002.
PERTH. W.A. 6001.

DIVISIONAL NEWS BROADCASTS. VK6WI PHONE 871103

Compiled and originated by Don Reimann VK6DY.

Sunday 0930 Hrs W.A.S.T.

80 Metres	SSB	3600	KHz
40 Metres	SSB	7080	KHz
20 Metres	SSB	14100	KHz
6 Metres	FM	52.656	MHz
2 Metres	FM	Ch. 2	Rpx

GENERAL MEETINGS.

Held on the THIRD TUESDAY of each month at 1945 Hrs at SCIENCE HOUSE, 10 Hooper St., West Perth.

COUNCIL MEETINGS.

Held on the LAST TUESDAY of each month at the QTH of the SECRETARY, 1930 Hrs. Observers welcome.

LOW MORSE TRANSMISSIONS.

There appears to be an acute shortage of volunteer operators for the nightly practice sessions. Can you spare 45 minutes one night per week to help out ? If so, then please contact Cliff VK6NK 250541 Extension 262 during normal working hours. We would appreciate your help.

Wakey Wakey ! MARK THIS ON YOUR CALENDER - and on the tail of your shirt too if it will help you remember * * * *

CHRISTMAS MEETING 1976 SCIENCE HOUSE 14th DECEMBER - Yes that's right, the 14th, so dont roll up a week too late - REMEMBER 14th DEC.

JAMBOREE ON THE AIR - 1976 - OCTOBER 16 - 17.

1976 is Scout Communications Year - The movement internationally is supporting Amateur Radio cause in the frequency fight.

JOTA is on EVERYWHERE from 0001 hrs on Saturday 16th OCTOBER to 2359 hrs SUNDAY 17th OCTOBER - local time. i.e. 48 hours from 1600 Z on the 15-10-76 to 1600 Z 16-10-76 in Western Australia.

NOTE*

This means from 1200Z on the 15th in 3D2, ZL, A3 etc., to 1200Z on the 17th in KL7, KG6 etc so overtime, if wanted, is permitted. THIS IS NOT A CONTEST !

The important things are the number of stations involved, and the number of Scouts and Guides introduced to Amateur Radio.

Number and place of contacts is recorded as a guide to activity and conditions. A good half hour contact with all participating is more important than a dozen difficult to hear non participating contacts of 2 minutes each, with dead time between.

European stations complained last year that they heard VK at good strength when the band opened, but tried without success to break in for a contact.

PLEASE TAKE A BREAK DURING OVERTIME IN CASE THE DX COMES THROUGH.

Scouts and Guides may speak on air from VK6 under supervision (not so in all countries). Any form of contact permitted by the regulations is allowed. HOWEVER, in deference to VK6 mobile operators WE DO NOT USE REPEATER FREQUENCIES, except for URGENT contact between amateurs - NOT SCOUTS.

World Scout recognised frequencies- (useful for calling "CQ Jamboree", or listening if quiet) are :-

7090, 14290, 21360, and 28990 KHz PHONE

3590, 7030, 14070, 21140, 28190 KHz CW. In addition VK6 operators may use 3580 phone as the 80 metre phone frequency is outside our band limits.

OPENING CEREMONIES.

VK6SH will have a VIP as usual at 2000 hrs (1200 Z) on Saturday 16th on 3.6 MHz AND A CALL-BACK, which may also be on 6 metres Ch B, 2 metres CH50 and possibly 14170 KHz. Please check during the evening.

Please do call in as it impresses the VIPs. All we want is :- Callsign, handle, Name(s) of Scout Group or Guide Unit, Location, and approximate number of Scout/Guide personnel listening or involved during the day.

VK1BP at 0800 hrs (0000Z) on Saturday, with the Chief Scout of Australia could be too early for most stations. If you are around please call back on 7070 or 14170 even if you can only advise that you will be a JOTA station at a later (civilized) hour !

REPORTS are the responsibility of the Scouts - NOT the amateur. They have their own special Log Sheets for you to sign.

73, Peter VK6HU
BE PREPARED.

10 metres - - - - - WHAT ABOUT IT ? ? ?

2/8

VHF NOTES

contributed by Will VK6UU.

Oscar activity is on the increase in the Perth area, with VK6ZGG and VK6ZAC heard through the 2 to 10 metre repeaters.

Channel 6 at Mt. William, recently received some maintenance and is now performing very well. The coverage of this repeater never fails to be a surprise, with mobiles in the Margaret River area being heard.

The IC22A's at Channel 2 Perth are still performing without fault.

The first opening of the season to Geraldton, on 2 metres occurred on the 10th of September, with very strong signals from Jack VK6EJ and Noel VK6NF into Perth.

Lindsay, VK6LJ, tried working Channel 8 whilst flying over Merrádin. Both Channel 3 Kalgoorlie and Channel 8 Wagin were triggered up, resulting in considerable confusion.

* * * * *

* * * A recent visitor to Perth was Mr Evan Fell VK4EF, who was involved with the Australian Computer Convention. He is an avid collector of Disposals equipment and would like anyone who may be wanting to quit some of this type of gear (preferably unmodified) to contact him. Unfortunately our information was received a little too late for anyone to contact Evan whilst he was in Perth, but he may be contacted at his home QTH.

Mr. E. Fell, 97 Jubilee Terrace, Bardon, Brisbane, QLD.4065.

* * * * *

FOR SALE

Don't forget to mention you saw it in the BULLETIN.

Heathkit SB610 Monitor Scope, with built-in two tone audio generator
Immaculate condition, \$140.00 plus freight.

Three element tri-band Cubical Quad. 19 foot heavy duty boom.

Employs Cubex cast aluminium spreader mounts and weather proofed bamboo spreaders, also features H & H ring balun requiring only single 50 ohm feedline for all three elements. \$130.00 + freight.

Contact VK6GZ, Gerald Miller, NCS H.E.Holt box 26, Exmouth.W.A.6707.
Phone 493234.

* * * * *

COLLECTION OF OLD-STYLE MORSE KEYS

Donations gratefully accepted -

Will however pay if tempted.

Dave Couch VK6WT, 9 The Grove, Wembley. Phone 819242.

More on SLOW MORSE. * * * * *
At the time of writing the practice sessions are only operative on three nights per week (maybe). Those listed are:- Monday VK6TU, Tuesday VK6PF, Thursday VK6DS.

For these operators and anyone who may care to assist in the future, the PREFERRED FORMAT is :- Five minutes of CW followed by a read-back. Don't forget to contact VK6NK on 250541 Ext 262, if you would like to help - even as a stand-by operator or as a relief op for just a couple of nights. THE MORE HELPERS THE LIGHTER THE LOAD.

Another quick reminder about the Christmas meeting. Science House is unavailable on our normal meeting night in December so the Xmas meeting has been put forward one week to DECEMBER 14th. C U there.

As promised last month, here is another project, locally built from information furnished some years ago in "Amateur Radio". The version about to be described was built up by A.M. Austin VK6MA who had for a number of years been interested in keyers.

The original appeared in A.R. November 1972, under the heading:- A SOLID STATE ELECTRONIC KEYS - I.E. Huser VK5QV. If your copies of the magazine do not go back that far or have been otherwise disposed of, a stamped addressed envelope with your request to the Editors will get you a copy by return mail. FREE!

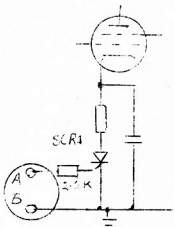
But on with the local story. GMA duly set about construction, after satisfying himself that the circuit seemed to offer what he had been searching for. Basically the keyer consists of two multi-vibrators controlled by gates, and a keying transistor.

A free running multivibrator produces a series of square pulses having a mark-space ratio of 1:1. The repetition rate and hence the keying speed is continuously variable between set limits, by a 50K pot in the multivibrator timing circuit. The O/P from this M.V. is fed to the keying transistor to produce a series of "dots" each having the correct length and the correct spacing.

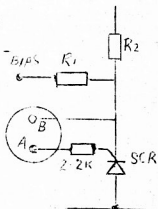
A bi-stable M.V. is triggered by pulses derived from the free running M.V. and produces a square wave O/P with a 2:1 mark-space ratio, which is also fed to the keying transistor. The O/P from both M.V. are combined to produce "dashes" of correct length and spacing.

Gating is so arranged that once a dot or dash has been initiated it will be completed together with the following space irrespective of the position of the paddle. SOUNDS SIMPLE, SOUNDS GOOD! O.K. let's get down to the nitty-gritty of making the flamin' thing -----, A printed circuit board was drawn up and etched and the components installed. Transistors used were BC109 and diodes "rescued" from computer boards. It worked like the proverbial charm, so much so that first Dave VK6WT and then Ross VK6DA followed suit with results equally as pleasing. In fact I believe that Dave prefers this gadget to a commercial keyer which he has operated for some time!

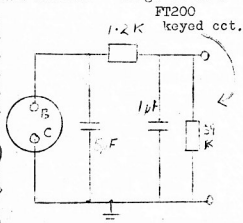
The original article details construction of a suitable paddle and also offers some suggestions on suitable methods of transmitter keying. However these details are beyond the immediate scope of this article and are left to the inventive genius of the individual. The least we can do is offer a fullsize P.C. layout and overlay of components. YES - it could have been made smaller - OK go to it!



Cathode keying of low-power stage

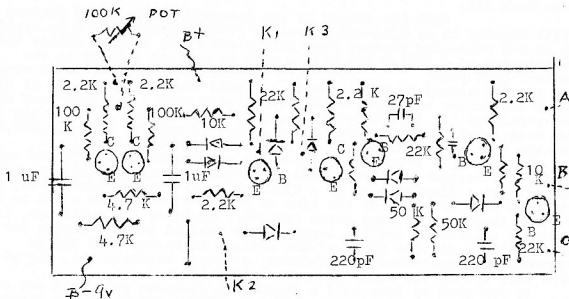
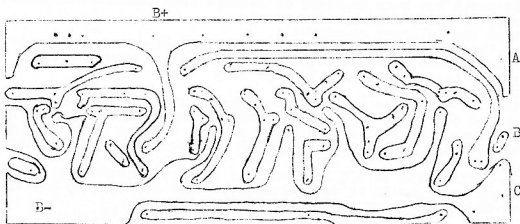


BLOCKED GRID KEYING
Modification for high blocking voltage.



KEYING THE FT200

A SOLID STATE ELECTRONIC KEYS : P.C. Board and Component Overlay.



FOR SALE.

New RG213U Coax - similar to UR67 - 50 ohm Lo-loss.

.45" Diam. Lengths available up to 100 metres

\$1.00 per metre.

VK6ZJF, John Farnell, Phone 926638 or W/H 253233.

MEMBERSHIP.

A B I G WELCOME and good wishes to the following

NEW MEMBERS :-

Lindsay Allen VK6LJ, Graham Pilsworth VK6ZJT

Stephen Huelin L60263, Allan Paton L60264

Phillip Reeves L60265.

August membership figures reveal the following :-

Full Members.....253

Full Members.....299
Associate Members..... 68

Student, Pensioner, Club... 33

Life Members..... 5

Total 359

.....

This month has been a harvest of letters from readers and proves S W L corner is being read by some people.

I hope the interest continues ..

Many thanks H AMFIST for your article it contains a message to all. You may notice a small segment has been censored regretfully but it may have been embarrassing to some XLs

Pleased to write again.

Esther to you also my thanks for your letter and I hope by now the expected equipment is installed and working. Lucky you plenty of space for antennae. You will connect many a piece back to front over the years I believe its called "BEING BLOODED" I look forward to hearing from you again.

GILL whilst this is S.W.L. corner it does not exclude you from making comment and I would be very pleased to hear from you at any time.

Many thanks for your assistants in the past.

MARK III.

Dear Mark III,

With the noises of the recently completed RD Contest still ringing in my ears and a bout of 'flu to sweat out, I am sitting up in bed wondering whether your reader(s)? might like to follow the experiences of a fellow SWL with a view to perhaps joining in the Contest next year.

Obviously the licensed Operator in my story and his QTH cannot be mentioned as he would have many hundreds of offers for a log keeper next year! However that's what I did this year and I can recommend the experience to anyone. Anyone, that is, who can pick out semi-intelligible callsigns and groups of numbers from QRM, QRN, QSB and the biggest dog-piles on all bands that you ever heard!

Of course we have many excuses for not reaching the 700 odd contacts that I understand one station had achieved. Perhaps it was our modest rig without a linear, hung on a G5RV (no fancy antenna farms here) plus the fact that for much of the time we couldn't even raise a VK6 to ask why our frantic CQ's were going unheard. Whatever the fault was, it suddenly cleared up and the logging rate reached two per minute for short bursts. At that stage of the contest it seemed that 95% of operators had succumbed to tiredness, electric blankets etc, for stations were very few on the bands from about 1800 GMT.

It was good to hear half a dozen club stations going all out to fill their log books. Pity there weren't more VK0's, VK8's and P29 stations to bump up the score sheets. Most of our 80 odd CW contacts were good copy and a great way to boost one's receiving capabilities. The exception was one full 10 minute call at about 5wpm with 7 or 8 repeats before the two vital numbers were recorded correctly in both log books! This says much for the spirit in which the contest was conducted when the 25 wpm operator at our end could have abandoned the slow sender and perhaps logged another four contacts in the same time. It also says much for the patience of the operator when, with his ear glued to the speaker to catch a signal which may as well have come from Upper Slobbovia on the long path, - to have the silence shattered by a thunderous SNEEZE !! from the log keeper - sufficient to trip the Tx VOX for several seconds.

This report would not be complete without a short resume of the "perks" which went with the log-keeping job.

* see next page*

EDITORS' NOTE : : : We have changed soaps several times, tried various brands of toothpaste and after-shave lotion but still have failed to attract anywhere near the number of letters to Mark III.

WHAT IS HIS SECRET ???.

Please write to US !

Dear MarkIII, Now Gill is licensed, only I can write to you and with any luck, this will be my last letter as a SWL. How about letting female amateurs write in as well as SWLs? Talking about SWL's, if VK6PD club members continue to get licensed at the present rate, we won't have any SWL's for next year's RD contest! From February we gained Gill ZGI Vic ZLO, Graham ZJT, and to keep us in line and act as my guardian - (that's what he says) Lindsay VK6LJ. Bob 6SY and Bob ZET have also been persuaded into membership. In the August exam, six members sat, Ken (who will cross modulate 6LJ's Tx when licensed and to shortly take a novice call, Max, Paul, Bruce, Michael (like me - again!) and myself. Others seen at the exam include Margaret (6PL's YF, another novice), Syd Jenkins (a main WICEN organiser in the recent search) John Baxendale, Jim, Stephen - Adrian will have to find a new log keeper for next year's RD Contest - and many others from Dave's classes and elsewhere, whose names we were too nervous to remember. Plus of course Adrian ZDA and Gill ZGI, sitting the Morse - two more full calls for 6PD ??

I would like to give fair warning to those people who have been waffling about me, safe in the knowledge that, having no rig of my own, I rarely listened (did you protest Glen ??) - the situation is being remedied. Having at long last finished my 12 volt power supply (thanks go to Adrian for noticing that due to thinking more of RD Contest numbers than of my power supply, I had wired the transformer back to front. I decided I needed something to plug into it. So when it arrives and when I get an antenna on the roof - don't laugh - the roof is above the ninth floor and I save on coax by living on the sixth (Mum won't move up to the ninth) - I advise people to watch what they say on repeater channels 2, 4, 6 and 8, and simplex channels 40 and 50. I think that is what I ordered but it was exam day so I'm not sure!

Lastley, would anyone knowing the whereabouts of an unwanted 28" girls bike, please contact me through any VK6PD member or somehow as I have hopes of going mobile !!!

33, 73, 88 (as applicable),

Esther.

Dear Mark III, I guess this will be my last letter to you as I am no longer a SWL, but I would like to take this opportunity to wish all the SWL's who sat the August exams the very best and hope to catch them on the bands. Also I would like to thank all the amateurs, especially Adrian VK6HA and Steve, his trusty SWL log-keeper who stayed awake the whole 24 hours to keep me company, for their help to our Radio Club and myself in the RD Contest. Adrian VK6ZDA and I would like also to say a special thanks to Dave VK6WT, Lindsay VK6LJ and a very special thanks to Don VK6DY for sending us CW the day and night before the exam - this really helped us greatly.

VK6PD has its first Novice Licencee - Ken who is now awaiting his call sign. Esther, Ken, Bruce, Mick, Paul and Max sat for the Limited examination so 6PD looks like having many more licenced members.

And now a plea to any other lady SWL or any SWL to write to MarkIII and help him keep this column alive. Cheers and 88's, Gill VK6ZGI.

THERE USED TO BE AN "XYL's CORNER" ----Eds.

SWL CORNER. cont.

The five-star room service at the particular QTH included the following :-

0730	GMT	Cup of tea while discussing tactics.
0830		Cup of tea plus savouries
0930		Sherries (said to be good for approaching flu)
1030		Cup of tea
1130		Four course meal with all the trimmings.
1145		Apologies from operators XYL while she went to the local picture theatre.
1545		King-sized servings of steak and eggs.
1600		Cup of tea plus pills and special medicinal beverage (to ward off the flu)
1715		Cup of tea before XYL retired.
2300		Breakfast a la carte.
2400		Cup of tea (plus old, tested Irish remedy for flu.)
0100-0800		Innumerable cups of tea interspersed with occasional doses of amber fluid (a last-ditch attempt to stop a raging attack of flu.)
0800		Celebration bottle of "sparkly" to mark end of RD Contest 1976. (also said to be good for shortening 'flu attacks.)

So any aspiring operators who have the opportunity of sitting in on the next RD Contest with or without "the perks" should grasp the opportunity. If every VK6 logged three hundred calls as we did, then W.A. would carry off the prize every time. Even though, as every old timer over this way will tell you- "The points are all weighted in favour of everyone else!" Anyway it's the Spirit of Remembrance Day that the Contest is all about and it seems to me that W.A. members at least, will not let this fade from their memories.

73, "Hamfist".

* * * * *

CONGRATULATIONS

to Glen VK6KY and XYL Stella on the safe arrival of their first harmonic.

* * * * *

OCTOBER MEETING.

As a result of many requests for another visit, the meeting on OCTOBER 19th. will be in the form of a visit to Perth Airport and an inspection of the DCA (sorry -Dept of Transport) installations.

Please use the DCA car park which can be located by following the road around in front of the main Terminal building. Do not veer right but continue on straight ahead and hopefully you will find the right spot over in the vicinity of the Lancaster Bomber which is on display. If these directions only serve to confuse you RELAX -there will be someone there to guide your wandering footsteps.

PLEASE BE THERE BY 7.30. Judging by the last visit this is a very interesting evening and could be quite late -so warn the XYL and save an awkward explanation afterwards.